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SYMPOSIUM ON PHYSIODYNAMIC THERAPIES IN PSYCHIATRY. PART II.

HORMONE THERAPY — *Roy G. Hoskins*

HOW I SUCCEEDED IN PERFORMING THE PREFRONTAL LEUKOTOMY — *Egas Moniz*

CONTEMPORARY PHYSIODYNAMIC THERAPEUTIC TRENDS IN PSYCHIATRY — *Arthur M. Sackler, Raymond R. Sackler, Félix Martí-Ibáñez, and Mortimer D. Sackler*

VOLUME FIFTEEN, NUMBER FOUR, OCTOBER-DECEMBER, 1954

Foreword

It is our hope that the new combined JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY AND QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY will harmoniously integrate the best features of what, up to now, were two different journals.

Under the direction of Doctor Winfred Overholser, Editor in Chief of the QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY, and Doctor Arthur M. Sackler, Editor in Chief of the JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY, the contents of this new journal is made up of original papers, devoted to clinical and experimental research in psychiatry and neurology, and abstracts of papers on other medical problems that are being reported in journals throughout the world.

The enlarged scope of the combined journal presents our readers with a complete panoramic view of the current developments and trends in the field of psychiatry and neurology. At the same time, through advanced clinical reports reviewing psychiatric and neurologic progress here and abroad, the reader will be kept informed of all facts of practical interest related to the daily problems of his profession, and he will also receive a comprehensive indication of what the horizons of the Psychiatry of Tomorrow will be, as they are outlined in today's research.

The JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY AND QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY welcomes the cooperation and contributions of all psychiatrists and neurologists interested in the progress of their specialties. With their aid, we hope to continue improving this journal in order to make it a practical, informative, and timely addition to the basic readings for all psychiatrists and neurologists.

JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY

&

QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY

*

VOLUME XV, NUMBER 4, OCTOBER–DECEMBER, 1954

JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY

ARTHUR M. SACKLER, M.D.—*Editor in Chief*
Director, Research Division, The Creedmoor Institute for Psychobiologic Studies

*

QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY

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Statement of Purposes

The JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY and QUARTERLY REVIEW OF PSYCHIATRY and NEUROLOGY are dedicated to the search for the fundamental factors in the etiology and pathogenesis of psychiatric disorders; to the training of an alert, progressive, and qualified psychiatric personnel; and to the stimulation and support of all phases of psychiatric service and research—biologic, chemical, psychologic, physiologic, and social.

In the pursuit of these aims, the JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY and QUARTERLY REVIEW OF PSYCHIATRY and NEUROLOGY will venture wherever the quest may lead. Its sole criterion will be the promise of an increment in the understanding of the mind's ills. It will seek, above all, to bridge national boundaries, language barriers, and the artificial demarcations of schools and trends.

The JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY and QUARTERLY REVIEW OF PSYCHIATRY and NEUROLOGY hold that there is no justification for the present discrepancy between the rich scientific technology available to psychiatry and the poverty of technics in current use in diagnosis, treatment, and research; no need for the gap between the promise of research and the paralysis of inquiry; no excuse for the lag of years between discovery and publication, demonstration and application in practice; no sound reason for the tragic chasm between the desire of the public for psychiatric education and guidance and the failure of the profession to provide the inspiration and leadership that would fully mobilize all latent potentialities. In brief, the journal is dedicated to the fulfillment of psychiatry as a science and a humanity devoted to the interests of all mankind.

The JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY and QUARTERLY REVIEW OF PSYCHIATRY and NEUROLOGY look on psychiatry as an integral whole that is, in turn, an organic part of the world of science. It seeks to be not a mere sheaf of passive paper, but a dynamic organism by means of which its editorial board will endeavor to utilize every opportunity and facility in the field of human knowledge to fulfill the tasks to which it is dedicated.

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JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY

*

ORIGINAL ARTICLES

Hormone Therapy 363
Roy G. Hoskins

How I Succeeded in Performing the Prefrontal Leukotomy 373
Egas Moniz

Roy G. Hoskins: Biographical Note 380

Egas Moniz: Biographical Note 381

Contemporary Physiodynamic Therapeutic Trends in Psychiatry 382
Arthur M. Sackler, Raymond R. Sackler, Félix Martí-Ibáñez, and Mortimer D. Sackler

QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY

*

Incorporating the International Record of Psychiatry and Neurology

ARTICLES

The Why and How of a Prevention Program in Mental Health 405
Kenneth E. Appel

PSYCHIATRY ABSTRACTS

Administrative Psychiatry and Legal Aspects of Psychiatry

On Freedom and Responsibility of the Mentally Ill 413

Clinical Psychiatry

Emotional Significance of Severe Trauma 413
Evaluation of Suicide Attempts as Guide to Therapy; Clinical and Follow-Up Study of One Hundred Nine Patients 414
Conflicts between Psychiatry and Religion 416
Delusional Reduplication of Parts of the Body 417
The Long Term Evaluation of Prefrontal Lobotomy in Chronic Psychotics 418
Work Adjustment Five to Ten Years after Bilateral Prefrontal Lobotomy; Follow-Up study of 86 Patients with Chronic Mental Disease 418
The Fundamental Nature of the Distinction between Normality and Neurosis 419
The Clinical, Pathogenic, and Therapeutic Aspects of Mental Anorexia 419

Geriatrics

Community Conditions and Psychoses of the Elderly 419

Heredity, Eugenics, and Constitution

Some Antecedent Factors in the Family Histories of 392 Schizophrenics 420

Psychiatry of Childhood

The Organization of a Training Program for the Cerebral Palsied in an Institution for the Mentally Deficient 422
The Psychiatrist and Learning Difficulties 422

Psychiatry and General Medicine

Depression in Psychosomatic Disorders 423
Description and Treatment of Heart Disease due to Anxiety 423
Intellectual and Affective Changes in Essential Hypertension 423

Psychiatric Nursing, Social Work, and Mental Fatigue

The Clinical Psychologist as a Humane Scientist 424
Collectivism, a Social Phenomenon of Our Time, and Mental Health 425

Psychologic Methods

Diagnosis of Brain Diseases by Psychologic Methods 425
The Life and Work of Hermann Rorschach 425
Research in Clinical Psychology: 1953 425

Treatment

A. General Psychiatric Therapy

The Psychiatric Sheltered Workshop in the Rehabilitation of the Mentally Ill 426

B. Drug Therapies

Chlorpromazine in the Treatment of Neuropsychiatric Disorders 426
The Problem of Activated Psychosis in the Insulin Therapy of Schizophrenics 427

Observations on Organic Brain Damage and Clinical Improvement Following Protracted Insulin Coma . . 428
Subconvulsive Intravenous Metrazol Therapy in Mental Patients 429
Isoniazid Treatment of Psychiatric Patients 429

C. Psychotherapy
Twenty Years of Group Psychotherapy; Purposes, Methods, and Mechanisms 429
Theory of the "Total Push" Program in Psychiatry 431
Group Psychotherapy in the Institution 433

D. The "Shock" Therapies
Electric Shock Treatment and the Menstrual Cycle 433
Unipolar Electrocerebral Stimulation; A New Method in the Treatment of Psychiatric Disorders 434
Anxiety after Electroshock Therapy in Involutional Melancholia 434
Value of Electric-Shock Treatment on Outpatients 435

NEUROLOGY

Clinical Neurology
Disturbances of Sensation in Children with Hemiplegia 436
Arterial Occlusions Simulating Neurological Disorders of the Lower Limbs 436

Anatomy and Physiology of the Nervous System
On Myelin and the Classification of the Nerve Fibers 437
A Note on the Early History of Cerebral Localization 437
Autonomic Functions of the Diencephalon, A Summary of the Experimental Work of Prof. W. R. Hess . . 437
The Pedunculus Cerebri and the Capsula Interna 438

Degenerative Diseases of the Nervous System
Homonymous Hemianopsia in Multiple Sclerosis 438
The More Frequent Degenerative Diseases of the Central Nervous System Discussed with Special Regard to the Viewpoint of Social Medicine 438
Anatomo-Clinical Observations on Tuberous Sclerosis 438

Diseases and Injuries of the Spinal Cord and Peripheral Nerves
The Diseases of the Peripheral Nerves 439

Electroencephalography
Electroencephalographic Changes Resulting from Carotid Artery Compression 439
Metrazol Activation as a Diagnostic Adjunct in Electroencephalography; A Re-evaluation 439
Metabolic and Electroencephalographic Changes in Idiopathic Epilepsy 440

Head Injuries
The Functional and Structural Bases for Psychic Phenomena Consequent to Cerebral Concussion 441

Infectious and Toxic Diseases of the Nervous System
Bornholm Disease 442
The Neurologic Sequelae of Tuberculous Meningitis in the Child 442
The Diagnosis of Poliomyelitis 442

Neuropathology
Histopathological Changes in the Brain in Schizophrenia; A Critical Review 442
The Pathology of the Blood Vessels in Multiple Sclerosis 442
Lesions of the Human Brain Following Circulatory Arrest 443

Treatment
Studies in Myasthenia Gravis; Preliminary Report on Therapy with Mestinon Bromide 444
The Surgical Treatment of the Cerebrovascular Accident 445
Trigeminal Neuralgia; Pathology and Treatment 446
Intrathecal Injection and Cortical Application of Cloramphenical—An Experimental Study with a Review of the Local Action of Antibiotics on the Central Nervous System 447
Stellate Ganglion Block in Acute Cerebral Thromboses and Embolisms 447

Miscellaneous
BAL in the Treatment of Neurological Syndromes 448
Ansotomy in Paralysis Agitans 448

BOOK REVIEWS
Connections of the Frontal Cortex of the Monkey 449
Aphasia Therapeutics 450

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This historical Symposium on Physiodynamic Therapies in Psychiatry will be published *as a clothbound book* which will contain all the papers in both Part I and Part II of the Symposium. It will be one of the most valued reference works in the library of the psychiatrist, the physician, the researcher and the clinician. This is the first time that the great discoverers of the somatotherapies have presented their works together in one volume. The *Symposium On Physiodynamic Therapies* will contain the following articles:

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JOURNAL OF CLINICAL
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*

Hormone Therapy

Roy G. Hoskins, Ph.D., M.D.
NEWTON, MASS.

On June 1, 1889, the aging French savant, Brown-Séquard, presented before the Société de Biologie of Paris a remarkable report upon the effects of testicular extracts administered to himself. Amazing amelioration of the disabilities of senescence were attested. So striking were the claims and so eminent was the proponent that world-wide interest was evoked at once. Researches on the endocrine glands multiplied, and a new chapter in biology began to unfold.

Alert psychiatrists were by no means oblivious of these new happenings and early sensed the possibility that they might lead to a clearer understanding of the etiology of mental derangements. From such understanding better treatment might emerge.

The hope was not unreasonable. It was becoming increasingly clear that normality of organic functions is dependent in a variety of particulars upon the action of the hormones. And that endocrine disorders may engender mental disturbances was made clear in the report of the British Myxedema Committee as early as 1888.[1]

In the years that followed numerous attempts were made to formulate the endocrine-mental relationships. Stertz,[1] for example, considered in minute detail the functional, structural, and psychologic results of various endocrine disturbances. He found hormone correlations with the manifestations of manic-depressive psychosis, schizophrenia, and epilepsy. Ferrant[1] believed the most probable underlying cause of the psychoses to be a toxemia, the toxin first stimulating and then determining fibrosis in the thyroid, pineal, and pituitary glands and in the gonads.

Weigand[1] postulated that the various functional psychoses are dependent primarily upon an innate disposition involving especially the central and vegetative nervous systems and the endocrine glands. Sicco[1] implicated the hormones in three possible ways: as primarily influencing brain development, as regulating the activities of the nervous system, and as factors in affectivity.

One of the most persuasive formulations was that of Langfeldt;[2] it was based largely upon his personal studies of the schizophrenic psychosis. He believed that the disorder is largely determined by an underlying constitutional defect, which depends upon a "specific inferior, endocrine formula." "The inferiorly constructed endocrine system, besides resulting in the development of the special constitutional type, also results in an inferior development of the brain. When, then, this inferior endocrine system at puberty, or through other accidental causes is exposed to too great a strain, we get the acute disturbances which we have seen in the acute phases."

As would be expected, many attempts were made to explore the therapeutic value of such endocrine products as were available. In 1922, Kraepelin wrote:[3] "Many years ago I endeavored to acquire influence on dementia praecox by the introduction of every possible organ, of the thyroid gland, of the testes, of the ovaries, and so on, unfortunately without any effect." But a year later, Wagner-Jauregg[4] wrote in more hopeful tenor, expressing the view that in early cases of hebephrenia the disease process can be favorably influenced by extracts of the thyroid and sex glands. In early dementia praecox in women showing genital hypoplasia, ovarian and thyroid extracts were reported to normalize both the genital and the mental states.

An adequate review of all the studies of gland therapy in psychotic conditions over the intervening years would go far beyond the intended scope of this article. Many researches have been carried out, some penetrating and well controlled but others superficial and impressionistic. The results reported have varied from very good to negligible. A representative portion of the literature has been reviewed elsewhere.[1, 5]

We may now turn to a discussion of some of the possibilities of hormone therapy as visualized today. The glands may be taken up *seriatim*. Of the disordered mental states, schizophrenia, with which the majority of the best studies deal, will receive the principal attention.

Our most nearly satisfying data are those pertaining to the *thyroid gland*. This is a highly versatile organ having numerous possibilities of pathologic influences in both its underactive and its overactive state. The thyroid has been aptly termed the "vital speed regulator." It directly promotes the oxidative reactions throughout the body and directly or

indirectly influences a variety of other metabolic processes also. It affects the development of all the bodily structures—including that of the brain—and the operative efficiency of each. To add to the tale of complexity, the thyroid enhances both anabolism and catabolism, sometimes the one and sometimes the other effect predominating. The over-all influence of the gland is thus an algebraic summation, the recognizable manifestations in any given case depending upon such factors as hormone titre, tissue responsivity, organ vulnerability, and other attendant influences, including the titres of other hormones that may facilitate or hinder the thyroid action. It follows that a large variety of symptoms can result from either overactivity or underactivity of this remarkable gland and that one who knows only classic myxedema or thyrotoxic goitre has no adequate acquaintance with it.

In the higher grades of hypothyroidism, the well-known sluggishness of myxedema is seen, but underlying the apparent placidity an element of truculent irritability can often be elicited. Stoll's study[6] of chronic hypothyroidism brought out such manifestations as irritability, mendacity, suspiciousness, delusions, retarded cerebration, inability to concentrate, introversion, and failing memory. Rarely, a picture closely approximating that of schizophrenia is seen.[1]

That the thyroid can influence the personality of the individual is sufficiently evident, but as to whether the gland is disordered in any consistent fashion in the psychoses, the testimony of the pathologists is ambiguous. In a large series of patients, including 815 cases of schizophrenia, Witte[1] was unable to confirm the high incidence of atrophy of the gland that had been reported by others, but he did note a tendency to accumulation of colloid, a finding suggestive of underfunction. Either fibrosis or normality has also been reported. Altogether, the morphologic evidence is impressive for neither its adequacy nor its consistency. However, the resources of modern cytology have not been adequately brought to bear. Direct determinations of the level of circulating hormonal iodine have failed to show evidence of thyroid disorder as a consistent accompaniment of psychosis.

Scarcely more convincing are the results of the many therapeutic trials that have been made. Numerous patients have received thyroid substance in different doses, for varying periods of time and often improvement has been noted but not with such regularity as to have won a place for the material in the standard treatment of the psychoses. One of the more recent studies illustrative of those in which rather consistent benefit has been noted is that of Danziger and Kindwall.[7]

Our own experiences in the use of thyroid medication have been summarized elsewhere.[8] During the course of an 18 years' study of schizophrenia, desiccated thyroid substance (or, in some instances, thyroxin) was administered to many patients for various periods and in dosages ranging from 1 to 60 grains daily. A variety of laboratory tests were included in the study. We ultimately came to recognize a picture that was regarded as indicative of functional thyroid deficiency and one that was rather consistently validated by therapeutic tests. The picture included all or most of the following features: scanty urine with reduction of total solids and nitrogen; subnormal oxygen consumption; downward trend of basal body temperature, blood pressure, and pulse rate; secondary anemia; and subnormal lung volume. We came to regard the triad of reduced oxygen uptake; secondary anemia; and scanty,

nitrogen-low urine as most significant. Seldom did the patients showing this triad fail to respond to thyroid medication with some significant degree of improvement. In numerous instances they were able to return home in a fairly restored state but in no case was a complete remission seen. Both psychologic and physiologic residuals persisted. Our final conclusion was that evidences of thyroid deficiency appear in about 10 per cent of adequately studied cases of schizophrenia and that in such cases thyroid treatment in the higher tolerable dosage ranges and for sufficiently prolonged periods (weeks or months) usually results in significant degrees of improvement but that in cases chosen at random, relatively little benefit from such treatment is to be expected.

The possibility that thyroid treatment might be of significant aid in "potentiating" other medicaments needs further quantitative, controlled study. Our own results from such use appeared to be favorable, but they were not carried to conclusive lengths.

Currently, attention is being increasingly focused on the *adrenal glands* as possible factors in mental disorders. Among the psychosomatic perturbations commonly seen in the psychoses are several manifestations that occur also in known adrenal deficiency. Thus, in schizophrenia, for example, there are often noted, general lassitude, low blood pressure, reduced oxygen consumption, anemic trend, and disturbances of sugar metabolism.[8] Among the manifestations of Addison's disease are apathy, anxiety, depression, incooperativeness, resentment, and, occasionally, paranoiac ideas.

As to whether the adrenals are actually disordered structurally in psychosis, the evidence is not impressive. It is neither adequate nor consistent. Various pathologists have recorded fibrosis or lymphocytic invasion, and Witte's study showed a tendency to depletion of cortical lipid material.[1]

More convincing of adrenal inadequacy in psychosis—at least in schizophrenia—is the accumulating evidence that the glands fail to respond in normal fashion when the patient is subjected to stress. This abnormality was noted in our earlier work[8] and has been confirmed and further studied by the group working at the Worcester Foundation.[9] Not only is the secretion pattern quantitatively abnormal but it also varies qualitatively from that seen in nonpsychotic subjects.

The two parts of the adrenals, the medulla and the cortex, must be considered separately. Although the medulla produces two active substances, epinephrin and nor-epinephrin, and although they have a special relation to the nervous system, neither has found much use in hormone therapy, except for their topical vasoconstrictor influence. It is to the cortices of the glands and their steroid secretions that practical interest now mostly turns. Among the most hopeful of the earlier experimental studies were those of Liddell and Hartman[10] on "neurosis." By the use of conditioning procedures, these investigators succeeded in setting up in sheep a condition rather strikingly resembling neurosis as seen in man. Following the administration of a cortical extract, "cortin" prepared by Hartman, the "neurotic" condition was substantially relieved. The work was well controlled and the effect of the hormone was clearly evident objectively.

Growing out of recent experiences in the treatment of arthritis and other human disorders with adrenal cortical hormone is the knowledge that this substance occasionally

induces euphoria and exuberant behavior that may rise to psychotic levels. This obvious lead has not yet been adequately followed up in the treatment of psychoses and especially those attacks in which depression is a prominent feature.

In our own studies, several adrenal preparations such as were available 20 years ago were tested for their therapeutic value in schizophrenia but with mostly negative results. The outstanding exception was a glycerine extract of whole gland or of cortex only which was clearly effective in improving the physical condition of the patients in such particulars as nutrition, blood pressure, and cardiovascular reactivity. Unfortunately, this improvement was not reflected in the mental sphere.[8] Since that period, reports of other therapeutic studies have occasionally appeared in the literature claiming good results from adrenal cortical derivatives, but critical psychiatrists remain skeptical of their value.

At present the situation regarding adrenal biology is in the process of profound change. From the effluent blood stream of perfused adrenal glands and from the blood or the urine of human donors, a surprisingly large number of previously unknown cortical derivatives are being obtained and their properties investigated. When the more significant of these become available for clinical use, the therapeutic results may become more impressive. Especially hopeful is the fact that it is becoming increasingly possible by the use of paper chromatography, spectrography, and other means to determine specific abnormalities in the cortical secretory patterns and thus to establish explicit indications for administering the individual cortical products.

The principal active derivatives, presumably hormones, from the *pituitary gland* include two from the posterior lobe that influence the activity of smooth muscle and the metabolism of water and electrolytes, respectively, and several from the anterior lobe. Among these latter are the growth hormone and individual "tropins" that regulate the activities of certain of the other endocrine glands. In producing these controlling agents the pituitary stands as a "way station" between the hypothalamus and such important regulatory agents as the thyroid and the adrenals that are under tropin dominance. To whatever extent the hypothalamus may be involved in psychosis or neurosis the anterior pituitary is likely also to be implicated. Occupying the key position that it does, it would seem to be all but certain that the pituitary would be implicated in any disturbances of biologic functions that the individual might undergo. Such disturbances would be expected to include mental mishaps, but explicit evidence that such is the case is notably scanty.

Claims have been made that increased incidence of "delinquency" is found in children suffering from pituitary disorders and even that reformation has been brought about by treatment with pituitary substance, but the evidence adduced in support of the claims is not impressive. The same may be said of a report that the terminal phase of acromegaly in which pituitary failure supervenes is marked by gradual loss of initiative and other evidences of weakened ego.

No less scanty than the *a priori* evidence is the direct test evidence that pituitary preparations have any profitable place in the treatment of mental disturbances. Our own studies with a variety of preparations then available gave no results worth recounting. Theoretically the various tropins might possibly have a place as therapeutic agents to stimulate the

sex glands, the thyroid, and the adrenals, but the tropins, being proteins, are inactive by mouth. Preparations suitable for parenteral administration are difficult to prepare and correspondingly expensive. In general it is more practicable to use the hormones of the target glands themselves. An exceptional case is that of the adrenocorticotropin which is sometimes given in preference to cortisone.

Of all the endocrine glands, the *gonads* would seem to warrant most hopeful consideration in relation to the treatment of mental disorders. In these, psychosexual disturbances are notably prevalent. The relevant literature is voluminous. It serves to establish the fact that sexuality is determined in part by social, psychologic, and a variety of physiologic factors. These include in large measure the so-called sex hormones, the androgens (masculinizing) and the estrogens (feminizing). These substances have numerous interrelated influences in the organism. They play important roles in the development and maintenance of the reproductive structures and serve as inciting factors in sexual behavior. The functions and interrelationships of these hormones are illuminatingly discussed by Beach.[11] To whatever extent sexuality is of etiologic importance in psychiatric disturbances, the sex hormones are obviously involved, but explicit evidence of such relationship at the objective level is still not very impressive.

Numerous observers have reported that schizophrenia in women is frequently accompanied by atrophy of the ovaries and attendant disturbances of menstruation.[1] Hemphill[12] has reported considerable evidence which supports earlier claims that testicular atrophy is a common accompaniment of schizophrenia and that a high correlation is demonstrable between the degree of atrophy and the severity of the psychosis. But full agreement on this relationship has still not been attained. At the functional level, it is undoubted that ovarian deficiency as seen in the menopause is accompanied by such evidences of tension as headache, irritability, vague pains, constipation and what not. In large measure these symptoms can be allayed by the administration of estrogen. Similar disturbances occur in hypogonadism in men and these, too, yield to gonadal hormone treatment. Testosterone, for instance, gives such effects as improved strength and sense of well being, enhanced ambition, feelings of competence and contentment—in short, the general sort of effects that the psychiatrist assays to produce by whatever means. With very large doses, these effects are reported to be obtainable in normal persons but for the most part preceeding hypogonadism is a prerequisite.

High hopes have been entertained for the utility of these hormones in the therapy of psychoses, but such anticipations have largely failed to be fulfilled. In our researches, for example,[8] 40 male schizophrenics were treated for two periods of eight weeks each by injections of testosterone proprionate. In well over half the cases, encouraging improvement was seen and the studies were continued, either with the injections or with methyl testosterone by mouth. Implantations of crystalline testosterone were also used. In several instances the patients became well enough to go home and a few remained out for over a year, making fairly satisfactory social and economic adjustments. Even in these best cases, however, psychologic explorations showed the persistence of residuals such as had been found in the thyroid series. The patients retained their psychotic mechanisms but had them under better control.

The therapeutic value of *insulin* in coma-inducing dosage is well known. Although this substance is indubitably a hormone, it is doubtful that it functions in the treatment in other than a pathologic fashion. That it is the induced shock, as such, rather than any physiologic influence of the hormone seems sufficiently clear. Within the physiologic dosage range, however, it may have some use as an adjunctive agent to improve nutrition and, at times, for a quieting effect.

CONCLUSIONS

The foregoing sketch can serve only to indicate one man's judgement of the current status of the subject. An adequate review of the many attempts that have been made to determine the value of hormone therapy in psychiatry would necessarily run to volume length and would embody much confusion engendered by conflicting testimony. So uneven, too, is the quality of the recorded reports and so few are the studies that have been carried out with adequate control to conclusive length that the judgement of the total would be largely subjective in any case. But even so, the conclusion is unavoidable that, although the issue is by no means closed, the bright hopes that have been entertained have by no means come to impressive fruition. Some of the reasons for the disappointment may be considered.

It may not be too ungracious to suggest that the most potent reason might be that psychiatrists as a group have been so overworked in their regular jobs that they have had neither time nor opportunity to bring to bear the type of exacting research that is needed to carry the necessary researches to a definitive conclusion. Moreover, research in the field of therapeutics is notably difficult—witness the still unconquered "common cold" or the commodious graveyards of remedies that have been proclaimed with enthusiasm but have failed to meet the test of time. Highly specialized training is needed for research of this type and not many psychiatrists have had such training. And specialized researchers in the therapeutic field are neither well-versed nor much interested in psychiatry.

Another obvious difficulty lies in the current imprecision as regards psychiatric nosology. It is a truism that a researcher should know exactly what he is studying. But precisely what is connoted by any psychiatric diagnosis is uncertain. Schizophrenia means one thing in one hospital and something else in another. In a given situation, if like things are regarded as different and if different entities are thought of as identical, the investigator is sure to be confused in estimating both his failures and his successes. Research strategy based upon such uncertainties is likely to succeed in achieving precise "yes" or "no" answers only by lucky accident.

But the difficulties do not arise wholly from psychiatric considerations. Endocrinology itself is by no means a mature science. Precise indications for hormone therapy depend upon correct diagnosis of the endocrine status of the patient. Relatively few of the diagnostic criteria that have been utilized heretofore are pathognomonic, and diagnoses have been correspondingly uncertain. This is true even when the subject is cooperative and relaxed. In psychotic patients, the uncertainties multiply. For example, a genuinely reliable "basal metabolic rate" is probably never obtained. It is only gradually that the diagnostic methods

are being improved to the point that they are adaptable to psychiatric patients, for example, utilizing the uptake of radioactive iodine as an index of thyroid behavior.

But the very precision that may be attained in the recognition of deficits in secretion of a given gland may lead to another sort of misapprehension and one that may be of more importance in psychiatric than in general practice. The secretion may be normal but the patient may be suffering from a veritable hypoendocrinopathy arising in inability of the body tissues to respond to the hormone in question. The occasional occurrence of patches of myxedematous skin in an otherwise normal subject illustrates this hypothetical possibility. The depressed reactivity to thyroid hormone that is seen in schizophrenia[7, 8] suggests that such hyporeactivity to hormones might be of significantly frequent occurrence in psychotic subjects. To whatever extent this is true the better treatment would be, not more hormone, but measures to increase tissue reactivity.

Another difficulty that is increasingly presenting itself in practical endocrinology is the multiplicity of hormones that may be produced by individual glands. Even in the case of a gland that has been so well studied as the thyroid, the true hormone may not be, as recently believed, the thyroxin complex, but tri-iodothyronine. The case is even worse for the pituitary or the adrenals from which several or many active substances—probably or possibly hormones—are derivable. Conceivably these might be discharged from the given gland in any possible combination and thus give rise to a variety of bewildering disorders, all deriving from a single gland. The co-existence of adrenal hypergenitalism and Addison's disease in the same individual is a currently recognizable condition which illustrates this possibility. At best the pluripotentiality of the individual glands might demand only greater explicitness of diagnosis—for example, instead of merely "hypoadrenalism," "hypocorticosteronism," or any one of thirty comparable disorders. But a few minutes spent in calculation of the various possibilities of combinations of these various substances acting in normal, reduced, or increased amounts will serve to show a fantastic approach of endocrinology to astronomy. The formula is 3 to the nth power, if the reader cares to amuse himself with it. Suffice it seriously to say that endocrinology is already so complex as to be far from its ultimate elucidation. Its meaning for psychiatry is comparably far from comprehension or realization.

A complexity of a somewhat different order arises out of the nice adaptation by which one hormone-producing gland is controlled by a hormone of another gland. For example, the anterior pituitary produces thyrotropin which stimulates the thyroid gland to discharge its hormone. But thyroid hormone depresses the production of thyrotropin. This is a biologic example of what is known in engineering practice as "negative feed-back" control. The thermostat on the living room wall which controls the behavior of the furnace in the basement is a common example. The function of this arrangement is doubtless to prevent the system from being flooded with thyroid hormone should overstimulating conditions arise. It can intervene in a frustrating way, however, when the physician wants to subject his patient to an increased supply of a given hormone. For instance, he may think that androgen is needed in greater amount than the patient can produce, hence testosterone injections are ordered. The only significant effect may be to depress the gonadotropic hor-

mone production enough to reduce the androgen production of the patient's own gonads to match precisely the amount administered. It is quite possible that many of the negative results reported in hormone therapy are negative by reason of such feed-back control.

Another difficulty in hormone dosimetry derives from the instability of hormone needs in accordance with changes of weather, of diet or what not. These changes may arise in natural rhythmicity of the bodily functions. During the menstrual cycle, at least four hormones are in interacting control and each is functioning at a different level at each day of the cycle. The best that the therapist can do is to administer his injections or his tablets in fixed dosage, in constant combinations, and at set intervals. This procedure results in a series of feasts and famines that afford but a sorry imitation of the finesse with which nature feeds in the hormones adaptively in accordance with fluctuating needs.

The foregoing paragraphs amount to little more than an inadequate discussion of a few aspects of the current lore of the hormones that seem to be of potential importance to research in hormone therapy of the psychiatric disorders. True it is that the early hopes for hormonal therapy of the psychoses have largely failed of fulfillment. But the endocrinology of the earlier day is not the endocrinology of today. And neither is the psychiatry the same. What the youth failed to accomplish perhaps his elder can attain. It may well be that a conjunction of the new psychiatry and the new endocrinology will bring forth fruits that even the earlier dreamers would not have disdained. Much more research is needed.

A few suggestions bearing upon future investigations may be offered. First the question of how a given hormone factor might operate in the etiology of a given derangement might be further considered. One long-recognized possibility is that a deficiency in its production might have rendered the subject vulnerable to experiential or other sort of noxa. In that case what could be hoped from hormone therapy to restore normal mentality? The individual has his psychosis and he is habituated to himself as a psychotic. Under that assumption, all that hormone therapy could be expected to accomplish would be to render the person nonvulnerable to current psychosis-precipitating factors of whatever order. It would remain to cure him by other means. But theoretically he could then stay cured.

Alternatively, the endocrine deficit might be regarded, as it most often is, as itself the etiologic agent. In that event, correction of the endocrine derangement might suffice to cure the patient as thyroid cures myxedema. Even under this naïve assumption, however, much research would still remain to be done. Just how did the deficit operate to bring about the psychosis? A clear answer to that question would throw much needed light on the nature of the psychosis and would point to measures that might be taken for prevention of such disorders. It might point the way, too, to more penetrating studies in the field of endocrinology itself.

A third interesting possibility is that the psychosis might be, as discussed elsewhere,[8] a result of failure of maturation. In that case therapeutic efforts should be directed not so much to the psychosis itself as to the factors that normally promote maturation. In this as in each of the other cases much attention might have to be given to the detection and correction of secondary abnormalities resulting from the initial defect.

However endocrine factors might operate to bring about psychosis, it is to be presumed

that a long time was required for the actual production of the disorder and that a comparably long period might be required for its cure. Perhaps in setting up researches on hormone therapy, the strategy should be based on treatment periods of months or years rather than days or weeks as have often been made to suffice in the past.

In reported studies pertaining to hormone therapy in psychiatry, the evaluations of the treatments have been attempted most often in terms of the direct effects on the disorders themselves. A somewhat different possibility is that the most significant success might be achieved by the use of the given hormone as an adjunct to other forms of treatment. This suggestion is in line with Ingle's concept of the "permissive" function of the internal secretions. It implies that while the hormone could not itself produce the desired effect in any given psychosis its presence might be necessary to permit the successful operation of other directly potent factors. A relatively easy way to test this possibility would be to administer the hormone to half the members of a group receiving "group therapy," the other half being given placebos.

And what is the conclusion of the whole matter? The way through the psychoendocrine maze has been arduous. Many unprofitable byways have had to be explored. And the equipment has been inadequate. The fruits that the explorers have brought back have failed to come up to their or our hopes. But hormone therapy has not been unique in the meagerness of its returns. Many other kinds of treatment have also been essayed—but no one is proposing to close the mental hospitals. Much shining new equipment is now at hand for setting forth other expeditions. Perhaps in the days ahead new expeditions will yield fruits that even the earlier dreamers would find pleasing.

The need remains. The researches should go on.

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How I Succeeded In Performing The Prefrontal Leukotomy

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My decision to perform the surgical operation which I named the "prefrontal leukotomy" did not come about as the result of some sudden burst of inspiration. This I made clear in my first publication on the subject (1936) and subsequently in the monograph first published in Turin (1937).

Considerably influenced by the doctrines of Ramon y Cajal, and basing my views on the concept of connected nerve cells, I had frequently reflected upon the genesis of normal and pathological psychic activity in its interdependence with neuronal activity. The impulses pass through the neurons via the fibrils, and in the synapses alterations are produced which, in turn, are projected into many other cells.

All this passed through my mind in the course of solitary cogitations on the subject.

Besides the functioning of the brain in connection with normal mental activity, there were also the disturbances characteristic of a large number of psychoses for which, up to that time, there was still no valid anatomicopathological explanation. My attention was particularly struck by the circumstance that certain mental patients—as a type, I had in mind obsessive and melancholiac cases—have a circumscribed mental existence confined to a limited cycle of ideas which, dominating all others, constantly revolve in the patient's diseased brain. And I sought to arrive at an explanation of this fact.

Nerve impulses come from everywhere: from the exterior world, via the nerve termini; from the chemical reactions and metabolic processes, which take place within the intimate confines of the nerve tissue; and from stimuli from diverse sources, many originating from the cellular activity of the intracranial neuronal complexes. Currents are formed which, at a high rate of speed, pass through the nerve conductors, ascending from the sensitive and sensory peripheral nerves and the great sympathetic nerve to the brain and the complex of tissue interconnecting the encephalic areas. The neurons are distributed chain-fashion, and the fibrils of the axis-cylinders are not directly linked to other cells; they form contacts through the Held's bundles, in various forms. The latter are the terminal organs of the fibrils which rest upon the dendrites and cell bodies without penetrating them. In the normal individual, these contacts do not become permanently and adhesively fixed.

On the basis of this anatomical concept, which we owe to Ramon y Cajal, I arrived at the conclusion that these synapses, repeated in countless cells, constitute the organic basis of thought.

Normal psychic activity depends upon proper synaptic functioning, while mental disturbances derive from derangement of the synapses.

Mental activity is interconnected in direct ratio to the functioning and interplay of these fibrillary activities.

The Held's bundles, at their point of contact with the nerve cell, rest upon an intercalary, separating substance, a membrane—or more probably, a colloidal substance—in which chemical and electrical phenomena take place, and possibly other phenomena of an unknown nature. These factors give the impulse current new qualities, or they contribute to the modifications which take place within the cell body. In this manner, the impulse passes on to other cells, where again new alterations occur.

When these fibrils cease to be healthy, or the intercalary substance undergoes alteration, due to exogenous or endogenous modification, the more or less complete discontinuity which ensues has the effect of interrupting the passage of the impulses. In still other cases, the Held's bundles, through abnormal adhesion, become affixed to the cells, and the impulses then keep following the same path and constantly giving rise to the same psychic manifestations. It is thus that I explain the persistence of the same morbid ideas, which are reproduced over and over again.

Even under normal conditions, there appears to be a certain tendency toward a relative fixity of the fibrils at the level of the synapses. When we are first learning to typewrite, for example, the operations performed are of necessity directly imitative. Practice makes this imitation easier, and when the operations have been executed many times, then automatism develops, in a greater or lesser degree.

This leads me to the conviction that a simplification of the path has been established in the succession of neuronal fibrils. Many of the side branches of the path, originally traversed, have ceased to be used. The course of the nerve impulses is so simplified in such cases that they no longer reach the synaptic complex which provides the notion of consciousness, for the act has been performed without its involvement, i.e., automatically.

In this manner a series of synaptic links is established, always the same, through which the impulses pass without hindrance and always arrive at the same destination.

The neurons are of organic origin and do not increase in number during one's lifetime, whereas the neuronal prolongations and the fibrils and arborizations are highly variable.

They vary in number from individual to individual, from the uneducated man to the educated. In the latter they are more abundant, and it is supposed that they present different characteristics, according to the person's degree of culture, as well as in different parts of the brain. The fibrils, on the other hand, vary in volume and shape: they grow thicker, more ramified and arborescent.

The terminal points at the level of the synapses do not function with the same intensity at the same time. We are still unable to prove this, and even less able to explain the intimate mechanism which conditions them.

The nutrition of the tissue doubtless plays an important role in the vitality of these minuscule but important organs, and the functioning of the synapses is affected both by exogenous intoxicants (alcohol, morphine, etc.) and endogenous ones, such as those of digestive, hepatic, and renal origin, and also alterations in the products of the internal glands, the various tissues of the organism, etc. All these intoxicants exert an ultimate effect on the synapses.

It is here that the anatomical and physiological substratum of many psychoses must be sought.

The actual passage of impulses has been demonstrated through the use of the galvanometer, which has shown the presence of electrical phenomena. This does not prove, however, that the impulses we have been referring to are solely of an electrical nature. They are doubtlessly much more complex, produced by the release of chemical energy and possibly other factors as yet unknown.

These nerve impulse currents are not immutable, nor are they haphazard in their movement. For this, evidence is provided by Pavlov's experiments on dogs. It has been incontrovertibly shown, through conditioned reflexes, that new paths for impulses or stimuli can be established in the brain, which lead to the same destination and have their origin in highly diverse fibrillary complexes.

If we place in the mouth of a dog food which it likes, as for example a piece of meat, abundant salivation results, which can be measured in terms of drops. The next time, just before the meat is placed in the animal's mouth, a definite sound is produced. This experiment is repeated a number of times.

Subsequently, when the meat is withheld, the sound alone has the effect of causing the saliva to flow in the same quantity and at the same juncture previously observed. The sound, contrary to what one might suppose, has acquired the property of producing an abundant salivary secretion in the animal.

New synaptic paths have been established in response to a sonorous excitation, wholly different from the gustatory excitation produced by the meat.

Although some reservations are essential when it comes to transferring to man phenomena established with regard to animals, conditioned reflexes nevertheless correspond closely to a number of facts observed in connection with the human brain.

The prefrontal lobe—a designation which does not seem to have met with the most favorable reception—is to us that part of the frontal lobe which is located directly in front of the motor region, and which has long been considered to be the part most closely linked with psychic activity. The premotor and motor cerebral areas, 4 and 6, lie outside the prefrontal lobe. Also excluded from it are the 8 areas and the 44 zone of aphasia.

This prefrontal lobe, as we have defined it, appears in mammals, and in man it is much larger than in the primates. It reaches practically twice the size of the anterior portion of the frontal lobe of the chimpanzee, and its cytoarchitectonic fields are, in turn, much more complex.

On the other hand, the prefrontal lobe is the most important brain mass in which it has thus far not been possible to discover localizations comparable to those we are familiar with in the occipital, parietal, and temporal lobes. Everything tends to indicate that the functions of these lobes must be of a different character.

The cytoarchitectonic structure of the areas of the prefrontal lobe present certain common characteristics which are considerably different from the motor areas. The granular layers are more developed in this region, while the layers of pyramidal cells, compared to those of the motor zone, are more reduced. Over and above this, its structure is not constant in

all individuals. It varies in its degree of extension and even, it would appear, in the quantitative correlation of its cells. The cytoarchitectonic charts of this region do not provide an exact coverage of all individual cases. From this fact the inference has also been drawn by some that the zone in question constitutes the base of all psychic functions. That it is a highly important region, there can be no doubt; but there is no center or centers which correspond to given mental activities. The entire brain and the entire nervous system are involved in the psychic activity of each individual, although there are some regions in which these higher functions are more concentrated than in others. Amongst these, the regions belonging to the prefrontal lobes must certainly occupy a position of prime importance. Also apparently correlated with these latter zones are certain diencephalic and mesencephalic areas, which in turn have a special function of their own. There can be no question, however, of any "centers" in the layman's sense of the term, and comparable, for example, to those of the motor zone. These, too, are not independent, but have a quite marked individuality.

The zones which are especially associated with psychic phenomena are less autonomous in their functioning than the brain centers mentioned. Their activity depends upon the increased quantity of synapses of highly varied neurons which play a part in the production of psychic phenomena.

The functions of the prefrontal lobes are known as the result of data gathered in connection with experiments on the higher animals and clinical data on man.

The experiments conducted long ago by Bechterew and Luzaro must first be considered. Having removed the frontal lobes from dogs, they found that the animals became aggressive, irritable, and impulsive. Their adaptive faculties were reduced. These findings were confirmed by experiments reported by other authors.

The work performed by Fulton and Jacobsen on previously trained chimpanzees is of especial value. They found that the unilateral excision of the frontal areas did not produce noteworthy modifications, whereas the extirpation of bilateral areas always produced alterations in the behavior of the animal. After extensive lesions, the re-education of the animal was no longer possible.

The same mutilations performed on the parietal and temporal lobes did not produce similar phenomena, which led these authors to conclude that the frontal lobes are associated with higher functions.

These findings are in agreement with what has been ascertained in the case of man. Clinical reports have provided useful data which throw light on this important problem.

In cases of lesions of the frontal lobe due to wounds, many cases of which were provided by the war of 1914 to 1918, disturbances in equilibrium, incoordination of movements, facial tics, and apraxia were found, all of which are more or less associated with mental activity.

Other observers have noted loss of attention and of mental synthesis, decrease in memory power and disappearance of the association of ideas. Some have also found changes in character and personality.

This apparent disagreement in the symptomatology observed reflects the varying extent

of the lesions, whether one or both lobes had been affected, and in some cases the association of other brain lesions.

A tremendous amount of literature exists on the subject of psychic disturbances in their relation to lesions of the frontal lobes, of which a special study was made by Karl Kleist of Frankfurt. Even more vast, however, is that pertaining to the study of mental disturbances in connection with certain tumors of these lobes. These latter cases are of less interest than the former, for they are almost always accompanied by intracranial hypertension with general symptoms which cannot be connected with the frontal localization of the neoplasia.

Such cases nevertheless offer new elements worthy of consideration. Baruk's opinion in this regard sums up the thinking of the majority of neurologists on the subject: It is tumors of the frontal lobes and of the corpus callosum which, of all the various types of intracranial tumors, are most frequently accompanied by psychic disturbances. According to my own observations, it is the tumors of the corpus callosum which most consistently result in psychic alterations.

Mental disturbances are highly accentuated when both frontal lobes are invaded by the neoplasia, to which tumors of the corpus callosum more or less correspond, anatomically, and with the same psychic symptoms.

Still another series of observations exists, of greater importance than those mentioned, namely, the literature on surgical ablations of the frontal lobes. It is known that one of these lobes can be excised without disagreeable effects on the patient's psychic existence. At most, there is a reaction of confusion and disorientation in time and space for the first few days; these disturbances, however, gradually recede (Penfield).

The case reported by Richard Brickner is of genuine importance. This author made a painstaking and persevering study of a patient from whom Dandy was obliged to excise substantial portions of both frontal lobes in order to be able to extract a large meningioma of the sphenoid. At first the patient lost some of his acquired knowledge; nevertheless, he continued to regress to his normal state, though not without noticeable shortcomings in the nature of change of character, suppression of his higher qualities of intelligence, etc. In the end, according to Brickner, the patient became essentially the same as he had been before the operation; he had preserved his "personal type."

The prefrontal leukotomy contributed better data with which to judge the functions of the frontal lobe. But I am going back into the history of it all here and speaking of the period before that in which I performed the operation which brings us together here at the moment. I am still on the other side of the river, outlining the reasons which led me to cross it.

If we consider, for example, melancholic patients, we find that they suffer from permanent afflictive ideas which are inaccessible to treatment, whether medical treatment, shock therapy, or psychotherapy. They live in a state of anxious torment from a continual thought to which all their normal life preoccupations are enslaved.

Unlike automatic acts, these morbid ideas are deeply submerged in the synaptic complex which conditions the notion of consciousness. They stimulate the synaptic complex and keep it in a continual state of live activity.

All these considerations led me to the following conclusion: These synaptic relations must be altered, and the paths in which the impulses revolve in constant passage must be modified, so that the ideas which are connected with them will be modified and the thought will take another course.

Guided by this reasoning, and having for over two years spent my every spare moment in reflection upon the matter, at the same time weighing my responsibilities, I came to the decision that I would undertake to cut the fibers joining the active neurons. Inasmuch as I was convinced of the importance of the prefrontal lobes in mental activity, I chose this region for the experiments. The choice appears to have been a propitious one. By breaking up these relationships and bringing other fibrillo-synaptic complexes into action, I could not help but transform the patient's psychic reactions and bring him benefit. Since my objective was to inactivate an advantageous number of associations, we decided in favor of attacking en masse the fibers of the cellular connections of the anterior portion of both frontal lobes. I wished to discover if this would achieve positive results. Pursuant to the destructive process, alcohol injections were first given, and immediately thereafter incisions were made with the leukotome, a small apparatus we devised especially for this purpose. Inasmuch as the white substance of the brain has a very limited circulation, our surgical operation had to be free of danger. The entire operation was carried out with the greatest of care, in order to safeguard the patients' lives.

Allow me, if you will, to quote at this point a passage from my volume *Tentatives opératoires* (*Surgical Experiments*) which marks a decisive moment in my career:

> In the disquietude I justifiably felt on the eve of the first operation to be attempted, all trepidations were overcome by my hope of obtaining favorable results. If, indeed, it was to prove possible to bring about the disappearance of certain symptomatic complexes of a psychic nature by destroying certain cell-connecting structures, we would have established in a definitive manner that psychic functions and the parts of the brain involved in producing them stood in intimate relationship with one another. This would represent a great step forward, as a piece of knowledge of fundamental importance in the study of psychic functions on an organic basis.

And in conclusion I stated:

> We do not doubt that what we have undertaken here will provoke a great deal of lively discussion, in the fields of medicine, psychiatry, psychology, philosophy and sociology alike. This we expect, but we continue to hope that any such discussion will contribute to the progress of science, and above all, to the welfare of mental patients.

Together with Professor Almeida Lima, my worthy collaborator, to whom a great part of the initial work is due, I set to work. The first alcoholization of the white substance of the prefrontal lobe was carried out on November 12, 1935. The first operation with the "leukotome" was performed on December 27, of the same year. Both cures and improvements resulted. No adverse effects that would have forced us to suspend our undertaking were observed.

As soon as we achieved positive results, we released an account of our work to the public.

Those who gave it a friendly welcome were few. Nevertheless, leukotomies were performed in other psychiatric centers, notably in Raconigi, in Italy, and finally, on the other side of

the Atlantic, came the achievements of Professors Freeman and Watts which definitely established the new operation as a beneficial treatment for psychoses. Their work was furthered by the availability of new cases and their development of a different surgical technique involving a more extensive incision of the white substance of the anterior part of the frontal lobe. They called their operation a "lobotomy."

Biographical Note

ROY G. HOSKINS

Doctor Roy Graham Hoskins was born on July 3, 1880, in Nevinville, Iowa. He was educated at the University of Kansas and later took his Ph.D. at Harvard (1910). In 1920 he obtained his M.D. at Johns Hopkins University.

His appointments include Professor of Physiology at Starling-Ohio Medical School, Professor of Physiology and head of department at Ohio State University, Research Associate at Harvard Medical School, and Director of Research at the Memorial Foundation for Neuro-Endocrine Research in Boston and the Worcester State Hospital. At present Dr. Hoskins is Research Professor of Physiology at Tufts College and Consultant in Research at Boston State Hospital.

ROY G. HOSKINS

Doctor Hoskins is a member of the American Medical Association, the Association for Study of Internal Secretions (president, 1926), the American Association for the Advancement of Science, the American Academy of Arts and Sciences, and the Association for Research in Nervous and Mental Diseases. He has also been president of the Society for Research in Psychosomatic Problems and the Gerontological Society. He is the author of the books: *Tides of Life* (1933), the well-known *Endocrinology* (1941), and *The Biology of Schizophrenia* (1946) and has written more than 150 technical articles. He was editor of *Endocrinology* from 1917 to 1940 and managing editor of the *Journal of Clinical Endocrinology* from 1942 to 1945. During the first world war, Dr. Hoskins served as captain and major in the U. S. Army Sanitary Corps. He is currently scientific staff assistant to the Boston branch office of Naval Research.

Biographical Note

EGAS MONIZ

Professor Moniz was born on November 29, 1874, in Advanca, Portugal. He was educated at the universities of Coimbra, Bordeaux, and Paris. Until 1911, he was professor of neurology at the University of Coimbra; since that date he has held the chair of Professor of Neurology at the Faculty of Medicine in Lisbon, Portugal. Other appointments include the post of director of the Institute of Neurology for Scientific Investigation in Lisbon and physician at the Hospital of Santa Marta in the same city.

The catholicity of Professor Moniz's interests comprises service as a deputy in the Portuguese Liberal Parliament, Minister to Madrid in 1918, President of the Portuguese Delegation to the La Paz Conference in 1918, and Minister for Foreign Affairs, 1918–1919. He is also a member of the Lisbon Academy of Sciences, the Paris Academy of Medicine, the Brazilian Academy of Letters, the Brazilian Academy of Medicine, the Madrid Academy of Medicine, Honorary Member of the Royal Society of Medicine, and of several other societies. He was awarded the Grand Cross of Isabella the Catholic of Spain, the Grand Cross of Public Instruction (Portugal), the Grand Cross of Santiago de Espada, and is also Commander of the Legion of Honor.

EGAS MONIZ

Professor Moniz is internationally known as the initiator of cerebral angiography and prefrontal lobotomy. He is author of numerous works on neurology and neurosurgery published in several languages, including *The Neurology of War* (1918), *Cerebral Tumors* (1931), *Cerebral Angiography* (1934), *Tentatives opératoires dans le traitement de certaines psychoses* (1936), *Die cerebrale Arteriographie und Phlebographie* (1940), and *Thromboses and Other Obstructions of the Carotids* (1941).

Contemporary Physiodynamic Therapeutic Trends in Psychiatry

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Psychiatric somatotherapies will make their greatest contribution to basic medicine, to physiology and pathophysiology and not merely to psychiatry.

In this context, psychiatry offers a series of experiments—natural, accidental and induced phenomena. Critical observation of these may lead to investigations elucidating the pathophysiology and pathogenesis of psychiatric disorders. More fundamentally, they expose basic elements of physiology. It is from this perspective that the efforts of our group are best viewed. From our original experiments through to the formulation of hypotheses and theories to which they have led, we have sought the "knowledge of the law of phenomena, so as to foresee, vary or master phenomena."[1]

This report scans the development of the newest physiodynamic trends in psychiatry. These trends are illustrated in part by the work of one group of contemporary investigators seeking to define the pathophysiology of psychiatric disorders, and in part also by a review of other researches.*

We will herein record how these physiodynamic therapies have already exposed new data, have opened new biologic investigations, and have afforded new insights into metabolic aspects of psychiatry and physiology.

In microcosm, our studies followed the classic course of investigation from initial observation of isolated phenomena, to hypothesis, to formulation of a series of experiments, further hypothesis, additional experiments, theories, and finally experiments again. One of the most interesting features of the study was the unswerving inevitability with which seemingly unrelated observations and apparently divergent studies led into physiology; also how the evolved theories conferred the property of predictability in respect to psychiatric and physiologic phenomena.

I. A BEGINNING IN BIOLOGIC RESEARCH

Observing variations in psychotic and "normal" behavior with changes in atmospheric pressure and taking note of the gamut of mental symptoms consequent upon "interference with cerebral oxidative processes, . . ."† [2] it was decided to test whether the ECT current

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* The "we" in this final section of the Symposium is symbolic not only of the investigators who worked with Dr. Johan H. W. van Ophuijsen—including Doctors Co Tui, Harry LaBurt and the authors of this report—but also of the efforts of other contemporary research groups. It is but one expression of the expanding development of this new chapter in psychiatric history.

† ". . . irrespective of causation, be it inadequate atmospheric oxygen, deficient blood oxygenation due to organic causes, impaired cerebral blood flow, improper cerebral oxygen exchange or disturbed cerebral cellular chemistry."[3]

being used therapeutically could be influencing cerebral oxidation by an effect upon the cerebral vascular bed. An experiment in which the standard ECT current was applied to a rabbit's ear revealed a vasodilating effect not only on the vascular bed of the "treated" ear but, after minutes, of the contralateral ear as well. This suggested possible liberation of a blood-borne "H substance."

Base-line studies (preparatory to observation of the effect of ECT on gastric hydrochloric acid) then demonstrated a high incidence of apparent fasting achlorhydria and hypochlorhydria in psychotics.[3] Administration of ECT caused marked elevation of free fasting gastric hydrochloric acid (even as such increase follows histamine administration).[4] Consequently, clinical trial of histamine as a therapeutic modality was undertaken by our group.*

Histamine Biochemotherapy

In our original studies, benefits with histamine in a four week experimental period were compared to those achieved with ECT in a control group. Following this, refractory patients in the experimental (histamine treated) and control (ECT treated) groups were "crossed over." It was found that refractoriness to one of these therapies was not necessarily associated with resistance to the other. Thus, the total number of improvements was doubled when patients were given a course of histamine and when histamine-refractory patients were promptly given a course of ECT. Further, it was noted that the confusion and memory defects following ECT were less when ECT was given to "histamine-primed" patients. At that time, attention was directed toward the importance of sharply delineating criteria for comparison of therapeutic modalities. Particular reference was made to differences in response as related to duration of illness. It was also emphasized that in experimental studies the utilization of short therapeutic periods (four weeks) would serve to minimize the incidence of spontaneous remissions and its distorting effect upon the evaluation of a therapeutic procedure.[2, 12]

Histamine Tolerance Higher in Psychotics—A Biologic Difference

Biologically significant was the observation that psychotics (in contradistinction to psychoneurotics) tolerate very large quantities of histamine.[13, 14] The importance of this finding was underlined by the demonstration of an association between histamine tolerance and severity of psychosis.[13, 14] As groups, hospitalized psychotics (schizophrenics) had the highest histamine tolerance, outpatients with psychoses (schizophrenia) a lower order of tolerance, and nonpsychotics the lowest tolerance. Observation of a low incidence of allergies in psychotics was noted.

Thus, in schizophrenics, (1) apparent fasting hypochlorhydria and high histamine tolerance, (2) low incidence of allergies counterposed against response of the disease process to

* The early use of histamine by other workers is recorded in the reports of these investigations.[5–11]

histamine biochemotherapy, and (3) stimulation of gastric hydrochloric acid by both ECT and histamine, all suggested investigation of adrenal dysequilibration in schizophrenia.

II. FURTHER CLINICAL AND BIOLOGIC STUDIES

Implications of Sex Steroid and Thyroid Therapy

At this time, one of our clinical investigations with anabolic hormones utilizing massive doses of testosterone balanced by estradiol demonstrated benefits in some schizophrenics.[13, 15] In other studies response to thyroid was noted. We then sought to determine whether there was a common denominator for both somatotherapy, i.e., ECT, and biochemotherapies, i.e., insulin, sex steroid, thyroid, histamine.[14] In addition to the recognized histamine-adrenal gland relationship, our demonstration of (1) reduced histamine tolerance following sex steroids and/or thyroid administration, and (2) the association of percentage increase in blood eosinophile level with degree of sex steroid-induced improvement brought the question of adrenal dysequilibration in schizophrenia further to the fore. The evidence thus tied two additional components of the endocrinium, thyroid, and gonads, closely to our consideration of adrenal function.

Physiologic Interrelationships: Thyroid-Gonadal-Adrenal Balance

There ensued a search for "counterproof" for the hypothesis that adrenal dysequilibration (as part of the pathophysiology, and probably of the pathogenesis of schizophrenia) could also be the reflection of disturbances in other endocrine functions (thyroid, gonad, and thymus glands). Thyroparathyroidectomy in rats was indicative of such counterevidence for it was associated with an increase in histamine LD_{50} (as opposed to the clinically observed decrease in histamine tolerance following thyroid administration).[16] Administration of propyl-thiouracil to intact animals revealed a similar relationship.[17]

Significantly, there was an approximate twofold greater increase in histamine LD_{50} in thyroparathyroidectomized females as compared to males. (This suggested that greater thyroid participation in the endocrinal balances of the female might underlie the clinical preponderance of thyroid pathology in this sex.) Since intact rats showed no sex difference in histamine LD_{50}, it was hypothecated that a counterbalancing sex difference must be operative in regard to one of the other endocrine glands. No significant sex difference in LD_{50} was observed following gonadectomy which, like thyroidectomy, raised histamine LD_{50} in rats[18] (counterevidence to the clinical demonstration of reduction in histamine tolerance following sex steroid administration.)

Discovery of a Thymic Function

Thymectomy[19] revealed the counterbalancing sex difference in our animal experiments. It was demonstrated that the thymus contributes to the adrenal-anti-adrenal balances, and that the increase in histamine LD_{50} in thymectomized male rats is double that found in

females. Thus, it was shown that thymus participation in endocrine equilibrations is greater in the male than in the female.

The demonstration of thyroid-adrenal equilibrations and the sex differences in thymus as well as thyroid endocrinal participation seemed to fit suggestively into several additional pieces of the over-all puzzle. Some of these other elements were defined by a series of clinical observations and studies which were independent of and/or concurrent and correlated with the physiologic experiments. Others were noted in the literature.

Studies of Mothers of Schizophrenic Children

Our finding of thyroid abnormality in a group of mothers of schizophrenic children should be considered in the light of some of the other data. A clinical observation, first made in 1950,[20] was supported by radioactive iodine studies[21] which demonstrated deviations in thyroid function in 5 out of 8 mothers of childhood schizophrenics. It was then suggested that both hereditary endocrinal elements and congenital (in utero) endocrinal factors must be considered as potential participants among the etiologic and pathogenetic factors in childhood schizophrenia.

Psychologic studies of both parents revealed marked psychiatric taints. As a long range perspective, it was decided to collect and study the entire families of childhood schizophrenics, and some 30 such family groups were admitted to the Creedmoor Institute for Psychobiologic Studies.

The implications of thyroid dysfunction in these mothers of schizophrenic children should also be evaluated not only in respect to the physiologic thyroid-adrenal relationships we and others have described, but also in respect to the clinical relationships between psychoses and thyroid gland function (as well as post-thyroidectomy psychosis). As far back as the end of the nineteenth century, Kraepelin remarked that he had noted changes in the size of the thyroid which appeared to be associated with dementia praecox: "In a series of cases, I observed diffuse enlargements of the thyroid gland, occasionally the disappearance of such enlargements immediately before the first appearance of morbid phenomena, also repeated rapid changes in the size of the gland during the development of the malady."

Studies of Schizophrenia in Childhood

Studies[20, 21] in the schizophrenias of childhood were instituted since they afford a number of advantages to the researcher. With this age group, investigation of the schizophrenic process in relatively "purer culture" is made possible because:

"A. Hereditary influences in children are more readily accessible to examination and evaluation than in adults.

"B. Congenital contributions are also more readily investigated. The child is less remote in time from maternal physiologic forces that may have been operative in utero, and the effects of such forces have been modified to a smaller degree by subsequent individual neuroendocrinologic developments than in adults.

"C. Somatic vicissitudes, internal psychologic conflicts, and environmental influences have

been fewer and usually less complicated, further aiding investigative appraisal. Familial and social forces are also more available for study.

"As a result, the schizophrenic process in children may be delineated in simpler and sharper perspective, particularly with respect to its etiologic and pathogenetic forces."[20]

In addition to such clinical findings as therapeutic response to histamine therapy, a prognosis inversely related to patients' histamine tolerance, and, surprisingly, directly related to the duration of illness, we also observed other interesting clinical and pathophysiologic hints.

Clinically:[21] 1. The true incidence of childhood schizophrenia is obscured by the subtleness of latent or compensated states in a considerable number of children.

2. Of the psychologic test findings, the most outstanding was evidence of the existence of organic factors—perceptual, conceptual, and sensory-motor.

3. Hereditary factors appear to play a major role. Of a total of 33 parents studied, evidence of schizophrenic pathology was noted in 27. This, too, was in line with the reports of other investigators in which a very heavy hereditary taint in this group[22–24] is indicated.

Pathophysiologically: 1. Childhood schizophrenia (in our series, as well as in others) occurs from two to three times more frequently in male than in female children.[22, 25–28] This certainly does not appear to be related to current psychoanalytic concepts. Interestingly, certain thymic disorders have a male predominance and the gland is most prominent during childhood.

2. In 1953, "after elucidating thymic participation in anti-adrenal balances as indicated by the data here presented, we searched the literature for the relation of the thymus to various mental disorders. In 1935, Worms et al reported that Bourneville found thymic aplasia and intact thyroids in 75 per cent of infant idiots. Previously, Klose and Vogt had produced 'feeble-mindedness' in puppies by removing the thymus in the second week of life. Gershon-Cohen, Shay and Fels, utilizing roentgen rays to destroy the thymus in rats, demonstrated the production of a state which resembled cretinism and which was more marked in the male. Thus, there appears to be an association between thymus and neuronal function."[19]

3. Other endocrinopathy, such as cryptorchidism, hypogonadism, Froehlich syndrome, thyroid "deficiency," or sexual precocity are striking in childhood schizophrenia.[21]

4. High thyroid and histamine tolerance as well as indications of abnormal blood glutamic acid levels were also noted.[21]

Mental Disease, Cancer, and Some Endocrine Considerations

Also to be considered in respect to thymus and thyroid are the interesting endocrinologic implications of the thin, poorly defined threads which seem to weave between these glands, cancer, and mental disease.

There has been a strong core of speculation on the interrelationship between thymus and cancer. Our observations on changes in the physical characteristics of blood in schizophrenia led us (through our belief that these were endocrinologically mediated) to an interest in cancer (a process at times susceptible to endocrine factors) and the relationship of neo-

plasm to psychoses. In 1951 we recorded a remarkable freedom from cancer, particularly of the breast and prostate, in schizophrenic patients as indicated by postmortem study. This was corroborated in a report by Pickworth.[29] Our observations on the interrelationships of histamine and thyroid as well as the thymus prompt us to call attention to recent findings relating changes in thyroid function and tissue histamine content to recurrences in breast and genital cancer.[30]

III. A NUMBER OF BIOLOGIC THESES

The interplay of experiment and hypothesis led, in this manner, to several theses:

Psychiatric: 1. Malignant psychiatric disorders, such as schizophrenia, are not only biologically determined, but are characterized by specific definable pathophysiology.

2. Adrenal dysequilibrations are specifically implicated in the pathophysiology and probably the pathogenesis of schizophrenia.

3. Consideration of adrenal or other endocrinal dysfunction involves recognition of the antidynal (antagonist) and prodynal interrelationships with other elements in the endocrinium. Evaluation of endocrinal effects necessitates consideration of more than "absolute output" of a gland. The ultimate effects reflect the interaction of "relative concentrations" of several endocrinal elements. Ultimately, the "operative concentration," the resolved sum of opposing (and/or reinforcing) endocrinal substances operating on the particular set or sensitivity of a given end organ, is the determining force.

4. These theories, then termed "physiodynamic," enabled the prediction, in 1949, that "the administration of ACTH (in the presence of extensive cortical reserves) or cortisone may eventuate in a significant incidence of psychoses."[31, 32] Further, it suggested that these hormones could be beneficial in certain psychoneurotic and psychosomatic disturbances and that their side effects were "hypothetically preventable and reversible" if the counterbalancing endocrinal relationships were exploited therapeutically.

Physiologic: 5. Participation of the thymus gland in adrenal balances was elucidated. The anticipation and demonstration of a counterposed sex difference of this balancing function in both thymus and thyroid was a result of the physiodynamic theories.

6. Counterbalancing of adrenal function by thyroid, gonadal, and thymus glands was revealed in respect to histamine tolerance.

Additional Biologic Findings in Certain Functional Psychoses

As data fortified the fundamental thesis, that certain psychoses were not only biologically grounded but were primarily the result of a physiologic disorder (with psychogenic factors playing secondary roles in pathogenesis*), we sought to define additional biologic parameters and their relationship to psychologic elements. The search was then concentrated

* In the psychoneuroses, it was suggested that endogenous psychogenicity was primary and biologic elements secondary, and, in psychosomatic disorders that exogenous (environmental) psychologic forces were primary and biologic factors secondary.

on factors which would permit psychiatric diagnoses on a quantitated biologic basis. Thus, (1) utilization of ultrasound (with special instrumentation) enabled the differentiation of psychotics from "non-psychotics" on the basis of autographic recordings reflecting physical differences in blood-clotting phenomena in whole blood.[33–35] (2) Blood glutamic acid levels were found to offer another differentiating parameter as they differed significantly between schizophrenics and "non-psychotic" controls.[36, 37] (3) Histamine tolerance was then related to scored human figure drawings demonstrating an association between this biologic parameter and a commonly used psychologic test device.[38]

IV. THREE POSTULATED BIOLOGIC MECHANISMS OF ACTION OF THE SOMATOTHERAPIES

(1) From the foregoing it becomes evident that our group envisions a neuroendocrine pathogenesis of psychosis which encompasses both the autonomic nervous system and the related interacting endocrine system. Our concept of the psychosis is premised upon the primacy of biologic factors.[39] In the briefest terms it holds that, therapeutically, measures which counter an over-active adrenalcortical system help restore the normal equilibration and function of a disturbed neuroendocrine system. Altschule[40] holds similar views. There is a large body of data of other investigators which can be marshalled in support of this thesis.

Physiologic data have also led to the formation of other biologic theories of the mechanism of action. Those of Gellhorn[41] and Himwich[42] are presented as further examples:

(2) Autonomic imbalance is implicated in schizophrenia and is corrected by electroshock therapy according to Gellhorn. He differentiates between the higher and lower sympathetic centers and between "peripheral action of sympathetic neuro-humors" and "that resulting from excitation of the hypothalamus." Gellhorn believes that since ". . . convulsions, hypoglycemic coma, and barbiturate sleep act quite differently on the cortex, these effects can hardly be assumed to reveal the physiologic principle upon which shock therapy rests . . ." though a common basis for action may be found in their effect on the autonomic system.[41]

(3) "The brain is deprived of energy, oxidative metabolism is inadequate to support cerebral function, and anaerobic breakdown of energy deposits is called upon to maintain the brain . . ." in both insulin and electroshock therapy, according to Himwich. He emphasizes that in addition to varying in intensity and duration the mechanisms differ in that during ". . . hypoglycemia the brain is deprived of glucose and cerebral metabolic rate is depressed below normal levels. With electroshock or metrazol, brain activity is raised to such a high pitch that it cannot be sustained by the oxygen and sugar coming to the brain in the blood."[42] This concept views the therapies as inducing a severe cerebral anoxia with concurrent cerebral metabolic depression and resorting to anaerobic forms of metabolism during the period of treatment.

Theories of Psychogenicity and Nonspecificity

Many other theories have been propounded, including psychoanalytic interpretations.

Some have sought refuge in the concept of "nonspecificity," a thesis which apparently has roots in the soil of pure or near-pure psychogenicity. Acceptance of such refuge need not be sought, for psychologic precepts do not presuppose conflict with modern biologic medicine. The development of the latter can only help further our understanding of the former. Thus, somatotherapy and biochemotherapy, which are so often successfully utilized as the sole therapeutic method, should not be viewed as exerting their effects through some secondary mechanism or adjuvant role. Rather, the data made available by studies of the effects of these therapies, whether of psychologic or physiologic import, should be subjected to continued scrutiny and appraisal. Uncovering of common physiologic pathways will lead to clues of the underlying physiopathology in the so-called "functional" psychoses and should help clarify its relationship to observed psychopathology. The physiodynamic-psychodynamic interrelationships and interactions may thus become more evident.

V. MORE ON BIOCHEMOTHERAPIES IN PSYCHIATRY

From this perspective, it would be well to review other data derived in investigations of biochemotherapies.

Thyroid Hormone, First of the Biochemotherapies

Thyroid was first utilized in psychiatry by Emil Kraepelin (1856–1927) to correct the psychopathologic manifestations in cretinism and myxedema.* More recently, Hoskins,[43] Danziger,[44] Gjessing,[45] Bowman et al,[46] and the Sacklers have reported both on its therapeutic applicability and its possible pathogenetic function. The demonstration by Hemphill, Reiss, and co-workers[47] of increased output of thyrotropic hormone during ECT is also significant in this regard. The remarkable tolerance to thyroid demonstrated in many schizophrenics and the apparent "physiologic dissociation" between radioactive iodine uptake and both protein-bound iodine level and the basal metabolic rate may lead to new insight into the role of the thyroid gland in schizophrenia. Attention is also called to our finding of thyroid dysfunction in a high percentage of mothers of childhood schizophrenics under study.

Testosterone

Testosterone has, in the recent past, been reported to be beneficial in the treatment of psychotic patients by Grundham,[48] Zeifert,[49] Danziger and Blank,[50] Rosenzweig and Freeman,[51] Hoskins,[43] Altschule and Tillotson,[52] and our group. In addition to the clinical value of testosterone, we have recorded and stressed the importance of its anti-adrenocortical effects. Among other changes, the increase in blood eosinophile count which accompanies testosterone therapy is directly related to its therapeutic efficacy, the greatest increase being noted by us in patients attaining the greatest clinical improvement.[53] This cellular shift

* Thyroid extract was first employed by G. R. Murray of England, who in 1891 successfully treated myxedema by parenteral therapy.

has also been reported following insulin coma therapy and has been noted during the course of spontaneous remission.

In addition to the use of thyroid extracts and testosterone, either alone or together with ECT, attention has been paid in the recent past to the therapeutic role of acetylcholine, desoxycorti-costerone acetate, and histamine.

Acetylcholine

Acetylcholine, intravenously, has been vigorously advocated by Fiamberti[54] (1943) as a therapeutic agent for the psychoses by induction of a "vascular storm." However, his "vascular shock" technique has not found wide use though deserving of further study.

DOCA

Desoxycorticosterone acetate (DOCA) was first utilized by Haynes and Carlisle.[55, 56] Subsequently, Jens[57] as well as Cranswick and Hall[58] reported on its therapeutic value. In her latest publication, Jens states that the study ". . . was undertaken on the basis of an assumption that patients with psychoses are subjected to repeated and overwhelming stress, which results in depletion." Administration of DOCA was thus viewed by Jens as replacement therapy.

It is noteworthy, however, that the relationship of DOCA, the mineralocorticoid, is, in many physiologic areas, one of antagonism to the glucocorticoids, an effect which we have indicated is common to the other biochemotherapies presently in use.

Histamine

Since 1938 histamine has been reported as having beneficial therapeutic effects by at least 12 independent research groups[2, 6, 9, 10, 59–66] and of being without value by three.[5, 67, 68]

The most recent comprehensive survey on the value of histamine was carried out at the Hospital Saint-Michel-Archange, Mastai, Quebec, Canada, by Doctors Rouleau, Nadeau, Delage, Coulombe, and Bouchard.[66] They found that ". . . discharge from hospital was attained by 20 of 100 patients (80 male and 20 female) following a course of histamine therapy (after the Sackler technique) over a period of 30 days . . ." Further, that of the 80 unimproved patients following histamine therapy, 4 patients were given thyroid and ECT with improvements in 3 and of the remaining 76 given a course of ECT alone (20 convulsions) one important improvement was noted. Following ECT, insulin coma therapy was administered to 11 patients with resulting improvement in only 2 cases. Thus, of a total of 26 patients responding to various therapies, 20 attained maximum improvement following a course of 30 days of histamine therapy alone.

All in all, investigations in seven countries have reported beneficial effects with some form of histamine biochemotherapy in well over 600 patients with rates of improvement varying from 13 per cent (after only four weeks of therapy and rigid criteria of improvement) to

near 50 per cent.* Apart from the therapeutic benefit afforded the patients, the physiopathologic implications may be of even greater import. For again, the evidence indicates there is present in the schizophrenic an excessive operative concentration of histamine-antagonist substances, possibly the adrenocorticoids. This would support the thesis of some type of sympatheticoadrenal predominance in the schizophrenias, at least in a significant percentage among this diagnostic category.

Synergistic Combinations

The principle of therapeutic synergism of electroconvulsive therapy combined with biochemotherapies is commonly applied in practice. Most psychiatrists have combined ECT and insulin coma after one or the other therapy, employed independently, has failed. Hoskins,[43] Danziger,[69] and others have reported therapeutic success utilizing thyroid hormone alone and together with ECT. Successful results with testosterone in massive dosages[7] suggest that this steroid may afford another companion therapy to electroshock. The response to combined histamine-ECT of histamine refractory patients and the reduction in ECT-induced confusion when histamine is used as pretreatment or concomitantly suggests the more frequent combined use of these two modalities.

VI. PHYSIOLOGIC COMMON DENOMINATORS OF PHYSIODYNAMIC THERAPIES†

The search for parallel effects of diverse somatotherapies and biochemotherapies employed in psychiatry may help in clarifying their mode of action, elaborating new therapeutic procedures, and elucidating the causative factors of certain disorders. However, seemingly contradictory data on the physiologic effects of electroconvulsive therapy, and of other modalities as well, are so frequently found in psychiatric literature as to make difficult the delineation of physiologic denominators common to these different measures.

Many of the disparate findings may be due to differences in the process of time as it relates to the individual, the course of the disease itself, and to the frequency and duration of therapy. Thus, the physiologic effects of one electroshock on a given day may be markedly different than those of 12 treatments over a three week period or of 20 treatments over a three week or two month period. Not only must the cumulative effects of successive treatments be considered but, also, attention must be directed to the dynamic fact that the patient and his physiology are ever-changing under the impact of therapy and time. Thus the over-all result may be a direct opposite to the effect of any one treatment. With this in mind, it would appear that these so-called puzzling contradictions, rather than being

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* (1) Horace Hill, Great Britain; (2) Marshall and Tarwater, Robb, Kovitz and Rapaport, Niver, Sackler, Katzenelbogen, U. S. A.; (3) Jacobowsky, Sweden; (4) Nagendranath De, India; (5) Gaviria, Colombia; (6) Gunter, Switzerland; (7) Rouleau et al. Lucy, Canada.

† This section as well as the preceding one on "Synergistic Combinations" is part of a presentation given at the Round Table Discussion on Research and Electroshock Therapy: A.P.A., May 6, 1954.

disconcerting impediments to the researcher (and, parenthetically, reassuring rationalizations for the cynic), may well be clues to new and fruitful regions for investigation.

Studies of electroshock, insulin coma, histamine, and testosterone have revealed certain physiologic common denominators. These were reviewed by our group in some detail in the *Psychiatric Quarterly*[13] in 1951 and are summed up as follows:

(1) The plane of adrenocortical function appears to be associated with positive changes in the patients' clinical status and with the physiodynamic therapies temporally. Thus, there are indications of increased adrenocortical activity early in the course of some therapies, while as treatment progresses and clinical improvement becomes manifest, physiologic findings point to decreased adrenocortical effects. As to the relationship between clinical status and adrenocortical function, reference is made to our report on the positive correlation between improvement in the patient's clinical status following sex steroid therapy and the attainment of high eosinophile levels;[53] to the similar relationship recorded by Finn Rud[70] during spontaneous remission of psychotics and after insulin coma therapy; to the relative eosinophilia noted by Cleghorn[71] following ECT, and to the reports by Ashby[72] and Altschule[73] that single electroconvulsive and insulin treatments raise urinary 17-ketosteroid output, at least in the early part of the course, while daily measurements usually show a decrease in output in patients with definite recovery. "It would seem that repetition of the therapeutic procedure reduces the continuing activity of the adrenal cortex, or, at least opposes its effects. This has been recently corroborated by Dohan, Bennet, Purcell, Winick, and Hecker, in a report to the Endocrine Society of Philadelphia.[74]

(2) Cerebral anoxia, according to Himwich, occurs during ECT and metrazol therapy. He relates it to the similar effect produced by hypoglycemia during insulin coma therapy. Doust[75] has recorded an initial phase of anoxemia followed by a rebound increase in oxygen saturation as measured by spectroscopic oximetry of reduction time.

(3) Greater reactivity in homeostatic response follows ECT, insulin coma, and histamine, according to Doust. In addition, he notes an initial hypotension followed by a second phase of rebound hypertension to be common to these therapies.

(4) Histamine or H-substance effects. Insulin coma therapy has been reported by Billig and Hesser[76] to produce a marked increase in blood histamine level. Furthermore, in their opinion, the depth of coma was more directly related to the blood histamine concentration than to the hypoglycemia. Clinically, this view is supported by the continuation of "hypoglycemia coma," even when the blood sugar level has been adequately corrected, and by the beneficial effects of adrenal hormones in countering protracted insulin coma.

ECT has been shown to cause an increase in fasting gastric hydrochloric acid.[4] This effect may be due to either or both vagal stimulation or acetylcholine liberation and/or histamine release during ECT. Similarly, insulin coma and histamine therapy are accompanied by an increase in gastric hydrochloric acid secretion.

(5) Changes in carbohydrate metabolism. Both ECT and insulin therapy influence carbohydrate metabolism. Several reports have demonstrated abnormal glucose tolerance of the "diabetic type" in a significant number of schizophrenic patients. It is of interest that with attainment of clinical improvement following ECT, there is usually an accompanying

normalization in glucose tolerance. Histamine, likewise, tends to influence carbohydrate metabolism in the same direction,[13] and to restore more normal insulin tolerance.[66]

(6) Electrolyte balance and water retention. ECT causes extracellular retention of sodium and water according to Altschule and Tillotson. This may be responsible for the facial coarsening often noted during ECT. Further, significant changes in sodium and potassium concentrations as well as the resultant shift in water balance would affect neuronal function and personality.

On the other hand, according to Himwich, during hypoglycemia of insulin coma, facilitation of ionic transfer within the neuron results in a loss of potassium and a gain of extracellular sodium with its consequent influence on the intracerebral water pattern.[42]

VII. THE NEWER PHARMACODYNAMIC AGENTS

The work with the biochemotherapies and the somatotherapies was the historical continuation of the search for physiologic agents capable of favorably influencing abnormal mentation and behavior. As physiologic agents they constitute a bridge to the recently introduced pharmacologic agents—reserpine and chlorpromazine. Thus, the biochemotherapies and pharmacotherapies are swinging back the pendulum of psychiatric orientation so long unbalanced by psychologic overemphasis.

In the past, the most commonly employed pharmacodynamic agents in psychiatry generally have been encompassed by the sedatives and the "mood alleviators." While the barbiturates and narcotherapy are extremely valuable both for symptomatic relief and for active therapy and the amphetamines continue to help in mild depressive states, they have many marked clinical limitations.

Chlorpromazine. Artificial hibernation and its modification as prolonged narcosis have been under fairly intensive investigation abroad, especially since Klaesi's work in the second decade of this century. However, while many investigators were encouraged by the therapeutic benefit afforded by this procedure, the mortality rate led to a reaction against its use.

During the first years of the current decade, Henry Laborit (France) administered a new drug, chlorpromazine, and reported marked effects upon the autonomic nervous system including the temperature-regulating mechanism.[77] The use of chlorpromazine in psychiatric disorders was first reported in France by Hamon, Peraine, and Velluz,[78] Deschamps[79] and Delay, Deniker and Harl.[80] In their report the last group (Delay et al) pointed out that this therapy is ". . . related to artificial hibernation in that it makes use of a new, central-action sympathicolytic, administered to achieve a continuous effect, which seems to play an essential part in hibernotherapy . . ." It is of much interest that one of the previously referred to physiologic common denominators of ECT, insulin coma, and histamine, namely, antisympatheticoadrenal action, is here pinpointed by these workers. Nor is the advantage of "continuous effect" (not possible with the previously utilized therapies, other than histamine) lost to them.

Subsequent to the research overseas, Lehmann and Hanrahan (February, 1954)[81] and Winkelman (May, 1954)[82] introduced this new pharmacodynamic agent in Canada and the United States, respectively. Other studies have since recorded the usefulness of chlorpro-

mazine in the treatment of psychoses and neuroses, especially in the presence of anxiety and tension.

However, in addition to the above beneficial psychic effects and its "central" sedation, chlorpromazine has a marked hypotensive action, hypothermic effect, and may also cause dryness of the mouth, nasal congestion, and in some patients miosis (rarely mydriasis) and allergic urticarial type reactions. (These side effects are of interest in the light of the previously described histamine-like action, physiologic common denominator of ECT, insulin coma, and histamine). More serious, unfortunately, have been the reports of the potential side reactions of chlorpromazine after continued use. Further trials are needed before final evaluation of the effectiveness of this new drug. It has, however, already given impetus to efforts directed towards the discovery of better biochemotherapeutic and chemotherapeutic agents for psychiatry.

Reserpine. Reserpine, unlike chlorpromazine, has a medical background of centuries,* though its chemical configuration has only recently been determined. Primarily a folk remedy, extracts of rauwolfia and especially of *Rauwolfia serpentina* (reserpine) had been employed in India as an antidote for "*insanity*," an antipyretic, and an ecbolic. It was in 1931 that Sen and Bose[83] reported on the use of rauwolfia extract in psychiatric disorders characterized by violent manifestations. They listed hypotension and asthma as contraindications. Thereafter, the clinical reports in India were primarily concerned with the sedative and hypotensive properties of the drug until 1943 when Gupta et al[84] reported on favorable results in a small series of affective and schizophrenic psychotics. Last year, Hakim[85] published comparative results achieved with ECT, reserpine, and other drugs in various combinations.

Sains[86] was among the first in this country to utilize reserpine in psychiatric disorders and he reported it to be beneficial in the control of hyperexcitement states. Subsequently, Noce and Williams[87] reported the results of clinical evaluation of reserpine. They concluded ". . . From our experience to date (with therapy ranging up to seven months) we believe that about 80 per cent of psychiatric patients show improvement that is attributable to the alkaloid. Depressed patients become alert and sociable, while the hyperactive, noisy, assaultive group becomes tranquil. The use of restraints, seclusion, and electroconvulsive therapy has decreased by at least 80 per cent since this study began. Remissions have been produced in 20 patients, (of 74 mentally ill) and 8 have been discharged. . . ."

Kline[88] evaluated reserpine as against the whole root of rauwolfia and a placebo. He stated that reserpine was found to be ". . . an effective sedative for use in mental hospitals" and that it also seemed to act to "reduce anxiety and obsessive-compulsive drives, and . . . overcome inhibition and reticence . . ."

Plummer et al[89] believe that reserpine induced ". . . sedation, reduced emotional response, peripheral autonomic alterations, and circulatory changes, explicable on the basis of an

* It was known as *sarpagandha* in Sanskrit, and used by Indian physicians for centuries. In Europe in the sixteenth century it was already in the herbarium of Dr. Leonard Rauwolf of Augsburg, the German botanist, physician and explorer, from whose name a French botanist derived *Rauwolfia serpentina*.

alteration of sympathetic-parasympathetic balance by partial suppression of sympathetic predominance at the hypothalamic level . . ." Ruffin[90] has reported that reserpine has a moderate to marked stimulating effect upon gastric secretion.

Kline noted nasal congestion in 5 per cent of his patient series. It is again worthy of note that these pharmacologic effects and side actions are histamine-like in action and have this in common with the previously discussed therapies.

LSD (d-lysergic acid diethylamide). Another promising new approach in psychiatry is based on the artificial inducement of a psychosis by means of the administration of certain substances which may provoke a temporary change in personality and a mental condition that approaches certain types of schizophrenia.

From medical history we learn that the Arabs in Mohammed's time, having been prohibited the use of alcohol, had already become addicted to hashish. Later, during the Crusades, a sect called Hachischines or "assassins," was organized in Arabia and Lebanon, which, under the iron rule of the Old Man of the Mountain, harrassed the invading Crusaders.

Under the influence of romanticism in nineteenth century Europe, hashish was used by poets and artists like Théophile de Gautier, Baudelaire, Delacroix, Daumier, and others. In 1845, the great French psychiatrist Moreau de Tours, a pupil of Pinel, had already studied the psychopathology of hashish, studies which were later expanded by Kraepelin, the first to systemize the psychopathology of chemical substances.

In 1943, Hoffman of Basle discovered the properties of a semisynthetic derivative of ergot called LSD (d-lysergic acid diethylamide). Later, Stoll, who first described the temporary psychosis provoked by a small oral dose of LSD, a psychosis which closely resembles a schizophrenic state, analyzed LSD pharmacologically.[91]

According to Hugo Solms[92] (of the Psychiatric Clinic of Professor J. E. Staehelin, Basle, Switzerland), these states would be diencephaloses.

Solms later experimented with d-lysergic acid monoethylamide (LAE). These two new drugs which provoke toxicosis may be of great value in the study of schizophrenia. Their use has given new impetus to the theory that underlying every schizophrenic process there is a "toxicosis." Interestingly, van Ophuijsen reiterated "dementia praecox is hysteria plus autointoxication." More recently, Sandison, Spencer, and Whitelaw,[93] of the Powick Mental Hospital, have used LSD with reported benefit in the treatment of 36 psychoneurotic patients.* It is interesting that in our physiodynamic formulations we viewed psychoneuroses as the biologic antithesis to the psychoses.

BRIDGE TO THE FUTURE

The modern development of the somatotherapies, the biochemotherapies, and the pharmacotherapies furthers the belief that we are on the threshold of the bridge to the future—

* LSD and LAE may open up a new avenue of research into the psychologic structure and physiopathologic basis of the psychoneuroses and psychoses while also helping to establish some challenging and most interesting similarities between the art productions of mental patients and the ones of modern artists.

a future which will see the mystery of insanity unveiled and the "torture of the bedevilled mind" effectively alleviated, if not banished.

In 1950, at the A. P. A. convention, our late associate, Dr. Johan H. W. van Ophuijsen, reported: "There are indications that the pendulum of interest which swung so far in the direction of the so-called dynamics of a psychologic nature will soon swing back in the direction of physical phenomena and probably of biochemical disturbances in particular."

That same year, at the International Congress of Psychiatry, Paris, we were honored by the opportunity to present our concepts and to review our work. We stated our conviction, ". . . that we are today on the threshold of the era of metabolic psychiatry. This metabolic era is as full of promise as the concurrently developing atomic era is fraught with dangers. Through the metabolic era psychiatry will come to its fullest understanding of neuronal physiology and its relationship to psychodynamics. Predictability and control will become fundamental to a science of psychiatry in which modern physics, chemistry, and mathematics will be fused into a newer knowledge of the energetics and integration of the nervous system whose bizarre symptomatologic manifestations have fascinated and victimized man from time immemorial."[91]

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Editor's Note

In the preceding issue in the paper entitled, "The Philosophy of Organicism in Psychiatry," reference was made to a publication by Dr. Manfred Sakel in 1934 on the treatment of psychoses by insulin coma. An additional reference, which has come to our attention since publication, indicates that the first report was published in 1933. This was a report of a meeting on November 3, 1933, and was published in the November 10 issue of Wiener Klinische Wochenschrift (page 1372).

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INCORPORATING INTERNATIONAL RECORD OF PSYCHIATRY AND NEUROLOGY

FOREWORD

The purpose of the QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY is to present promptly brief abstracts, noncritical in character, of the more significant articles in the periodical medical literature of Europe and the Americas.

For readier reference, the abstracts are classified under the following general headings:

PSYCHIATRY

1. Administrative Psychiatry and Legal Aspects of Psychiatry
2. Alcoholism and Drug Addiction
3. Biochemical, Endocrinologic and Metabolic Aspects
4. Clinical Psychiatry
5. Geriatrics
6. Heredity, Eugenics and Constitution
7. Industrial Psychiatry
8. Psychiatry of Childhood
9. Psychiatry and General Medicine
10. Psychiatric Nursing, Social Work and Mental Hygiene
11. Psychoanalysis
12. Psychologic Methods
13. Psychopathology
14. Treatment
    a. *General Psychiatric Therapy*
    b. *Drug Therapies*
    c. *Psychotherapy*
    d. *The "Shock" Therapies*

NEUROLOGY

1. Clinical Neurology
2. Anatomy and Physiology of the Nervous System
3. Cerebrospinal Fluid
4. Convulsive Disorders
5. Degenerative Diseases of the Nervous System
6. Diseases and Injuries of the Spinal Cord and Peripheral Nerves
7. Electroencephalography
8. Head Injuries
9. Infectious and Toxic Diseases of the Nervous System
10. Intracranial Tumors
11. Neuropathology
12. Neuroradiology
13. Syphilis of the Nervous System
14. Treatment
15. Book Reviews
16. Notes and Announcements

In fields which are developing as rapidly as are psychiatry and neurology, it is obviously impossible to abstract *all* the articles published—nor would that be desirable, since some of them are of very limited interest or ephemeral in character. The Editorial Board endeavors to select those which appear to make a substantial contribution to psychiatric and neurologic knowledge and which promise to be of some general interest to the readers of the REVIEW. Some articles, highly specialized in character, or concerning a subject already dealt with in an abstract, may be referred to by title only at the end of the respective sections.

A section entitled INTERNATIONAL RECORD OF PSYCHIATRY AND NEUROLOGY is included at the beginning of the journal. The Record Section consists of advanced clinical and experimental reports.

The Psychiatry and Neurology Newsletter was compiled by Doctors Leon Epstein and Francis N. Waldrop.

The Editorial Board at all times welcomes the suggestions and criticisms of the readers of the REVIEW.

WINFRED OVERHOLSER, M.D.
Editor-in-Chief

Psychiatry and Neurology NEWSLETTER

ATTRIBUTES AFFECTING THERAPEUTIC RESPONSIVENESS: A study with outpatients to determine those attributes which have bearing on the patients' responsiveness to individual and group psychotherapy is being carried on by Dr. Jerome D. Frank at the Phipps' Clinic of Johns Hopkins University. Therapeutic procedures will include analytically oriented group therapy once a week, individual therapy one hour a week, and "minimal contact therapy" in which patients are seen no more than one-half hour every two weeks. Each patient will be evaluated by rating scales before the inception of therapy, at its conclusion, after six months, and at increasing intervals thereafter on the basis of interviews with the patient and a relative. Both clinical and statistical evaluations will be made.

NEUROLOGIC BASES OF BEHAVIOR: W. R. Ingram and J. R. Knott of the College of Medicine, State University of Iowa, are conducting a research program on certain neurologic bases of behavior. The project includes investigations of the effects of stimulation and lesions of the brain stem activating system, the thalamic projection system and some basal forebrain structures on learning and learned performance, a study of experimental hypothalamic and upper midbrain lesions in relation to affectivity, and investigation of the relationship between stimulation of forebrain structures and sleep. The work is being carried out on mature cats.

DIMENSIONS OF PERSONALITY: Twelve independent dimensions of personality are being studied by Raymond B. Cattell of the Laboratory of Personality Assessment, University of Illinois. The research program will investigate the relative contributions made by environment and heredity to normal personality variants. Preliminary evaluations indicate that certain personality dimensions are due primarily to heredity, others to environment, and some to a combination of these factors. A high degree of heredity determination was found in the cyclothyme-schizothyme, in general intelligence, and in dominance-submission dimensions. The data also support the clinical view that variation of environmental events within the family is more important for personality development than variation between families. Results of this research are scheduled for publication in the American Journal of Human Genetics.

REACTIONS TO STRESS: The response of the peripheral vascular system to stressful situations is the subject of a two year research project by Theodore F. Trenting of the Tulane University of Louisiana School of Medicine.

The purpose of the study is to develop a test to determine an individual's ability to withstand stress and to find the type of stress which will most consistently produce the vascular changes under observation. Subjects under scrutiny will include apparently normal individuals, those with peripheral vascular disease, and persons with psychosomatic or psychoneurotic symptoms unrelated to the peripheral vascular system. Changes in the peripheral blood vessels are evaluated by the plethysmograph.

PATTERNS OF SCHIZOPHRENIA: Schizophrenic reaction patterns and theories concerning schizophrenia as reported in The Six Schizophrenias are phases of a survey by S. J. Beck in the Orthogenic School of the University of Chicago. The objectives of the project are to test, with children of that school, the six patterns of schizophrenia found in a preceding study, to trace and evaluate changes in the children under study, and to study environmental backgrounds with special reference to etiologic implications.

OPINION SURVEY OF MENTAL ILLNESS: An attempt to analyze the ways in which beliefs concerning mental illness are related to and influenced by prevalent preconceptions of human behavior is being made by Shirley A. Star, senior study director, National Opinion Research Center, University of Chicago. The following conceptions of mental illness are included: information about and firsthand acquaintance with mental illness, what is popularly meant by mental illness, criteria used in deciding what to include and exclude from this category, types of syndromes recognized and unrecognized, popular beliefs about the etiology, treatment, and prevention of this condition, attitudes toward the mentally ill, and attitudes toward the profession of psychiatry. Titled "The Folklore of Mental Illness, and an Inquiry into Contemporary American Thought," the survey will consist of over 3,500 interviews with a representative cross-section of the adult, non-institutionalized population. Results will appear in a Commonwealth Fund monograph published by Harvard University Press.

INVESTIGATIONS WITH LYSERGIC ACID: Preliminary findings, by Dr. Hans Hoff of the Psychiatric Neurologic Clinic of Vienna University, on investigations with lysergic acid indicate that schizophrenic manifestations have appeared in healthy individuals placed on small doses of this drug, but not in persons with anatomically verified lesions of the diencephalon. From this it was concluded that lysergic acid interferes primarily with diencephalic function, thereby offering further evidence for an organic basis in schizophrenia and warranting emphasis on organic therapy. Another aspect includes a combination of insulin shock and lysergic acid treatment which it is felt provides some therapeutic measure for hebephrenic manifestations.

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QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY

Incorporating the International Record of Psychiatry and Neurology

The Why and How of a Prevention Program in Mental Health*

Kenneth E. Appel, M.D.†

PHILADELPHIA, PENNSYLVANIA

The study, care and treatment of the mentally ill is above all a human problem. It is one of the most extensive and expensive activities of state governments. The states have constitutional authority expressed through laws for commitment, competence, standards of public health and the care and treatment of the mentally ill. They have responsibility for the optimum return on taxpayers' dollars, not by short-term, stop-gap programs, which are wasteful, but by the development of long-term planning. This Governors' Conference is an indication of the broad social implications of and governmental responsibilities for the mental health of the people.

Governors and legislators are harassed by the conflicting claims of their constituents. But for governors these problems persist for only two, four, eight years. For psychiatrists, the pressures pound at our ingenuity, our ideals, and our heartstrings for a professional lifetime. We speak for the 900,000 patients who pass through our mental hospitals annually, for 9,000,000 and more who are disturbed in heart or mind, frustrated, confused, anxious, or depressed, plagued with inferiority feelings and emotional-physical illnesses, unable to take part with zest and effectiveness in family, social life, and work. They may be driven into psychosomatic disease, alcoholism, drug and narcotic addiction. The results may be proneness to accidents, or delinquency, crime, and psychopathic behavior against their fellowmen.

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* Address delivered at Governors' Conference on Mental Health, Detroit, Michigan, Feb. 8, 1954.

† President, American Psychiatric Association; Professor of Psychiatry, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.

Facts and figures about mental hospitals are tormenting and depressing. There is an alarming shortage of psychiatrists, nurses, and attendants. There is great overcrowding, and treatment is shockingly substandard. Is it any wonder one of our leaders speaks of a national disgrace when out of 300,000 registered nurses only 2/5 of 1 per cent are engaged in general duty nursing in mental hospitals? The Central Inspection Board of the American Psychiatric Association reports hospitals with perhaps two RN's for 2,000 patients. Hospitals are 66 per cent understaffed in RN's and 38 per cent in attendants. There is 20 to 30 per cent overcrowding in 71 per cent of the hospitals, and in some there is a 50 per cent overpopulation. One hundred and twenty thousand new beds are needed. Hospitals are 40 per cent understaffed in physicians. There are 29 hospitals with 37,000 patients with no psychiatrists, and 5 other hospitals with 2,000 patients who do not employ a full-time physician. There is need of 15,000 more psychiatrists. Similar disquieting figures exist for other personnel: attendants, psychiatric social workers, psychologists, occupational therapists, and physiotherapists.

The Central Inspection Board has inspected between 70 and 80 hospitals in 24 states and provinces in Canada (Dr. Ralph Chambers). With the conservative stretching of standards, in all conscience only perhaps 25 per cent can be *temporarily* approved. There are snake pits, more than have been made known. This, in my opinion, in the great majority of instances is not due to the superintendents, commissioners, governors, legislators, psychiatrists in general, or the public. There is a distributed responsibility we all must share. Many of the superintendents are doing heroic jobs under almost impossible conditions. The American Psychiatric Association is tackling these problems with very limited resources. The medical director, Dr. Blain, with vision and energy has developed many progressive projects, perhaps the most significant of which is the Mental Hospital Institutes. At these conferences administrators pool their information and try to discover better ways of using their very limited personnel and facilities. This is an inspiring movement and one of which our whole country can be proud. We wish that more legislators would attend these meetings.

Treatment can scarcely be spoken of for the majority of the 700,000 patients in mental hospitals. It is mostly care and custody. For the most part the care appears to be adequate from the point of view of clothing, food, sanitation, and kindness. However, mass methods and regimentation are the rule. Electroshock is available in most hospitals, but 40 per cent of our hospitals lack adequate staff for insulin treatments. Individual treatment, individualization, personal contact, and conferences between psychiatrists and patients, the keystone of modern psychiatric treatment, are absent except in the rarest instances. Intensive treatment of acute conditions, which is imperative for good results, is not available in many hospitals or is done in a hasty, haphazard, superficial way. It is remarkable, therefore, and a tribute to men working under such odds, that the length of residence for patients has been shortened significantly, and that some of our public hospitals are discharging between 60 and 70 per cent of patients under 60 years of age in the first year of hospitalization. This is a bright spot in this very dismal picture. With more adequate treatment, presumably, the length of stay could be further reduced at great saving in terms of human

suffering and expense to the state. The greatest need is the recruitment of personnel—first of all psychiatrists—to give the treatments we know how to give.

However, is it any wonder that a shudder of apprehension goes through the country when within a few years a half dozen men of superior ability resign as superintendents? And I can assure you that there is anxiety throughout the professional personnel in our country today because of this situation. Superintendents and their staffs feel threatened. They are not only frustrated by the usual state of affairs, but opportunities and goals strained for through a lifetime seem threatened, and morale is low. It has seemed to me that just as we have had inestimable benefits from the Flexner report on medical education and the American College of Surgeons' study of hospitals, so now it is time for a study by sociologists or political scientists or both of state mental health programs and administrations—the factors making for breakdown and crises and the factors making for success. Are change of political administration and politics the chief factors in breakdown of programs, or is it difficulty in public and personal relations on the part of directors of mental health or superintendents? The American Psychiatric Association cannot make such a study; neither can a state government make an appropriate independent and objective investigation. The U. S. Public Health Service cannot appropriately do it. We need skilled, outside, independent investigators. Such research undertaken over 6 or 10 years, studying all sides of the situation impartially, could turn up findings and recommendations that would be of great help to administrators, commissioners, governors, and society. Such a study might well begin with several well-known state hospitals, whose administrators have had such signal success in establishing outstanding treatment, training, and research programs, which are the backbone of progressive psychiatry, and where recruitment is spontaneous and applications exceed available positions. The superintendents at these hospitals have survived changes of political administrations. Time is ripe for an immediate study.

In the meantime the American Psychiatric Association stands ready to render greater service to the various states by providing *consulting teams*, which would visit a state at the request of the governor. They would study problems and recommend to him the type of state organization of mental health that might better serve his needs, as well as give advice on some methods of operation. Doctor Blain of the American Psychiatric Association has already organized several such surveys with local professional cooperation and the results have been constructive. Many times an incoming governor with the very best intentions may have difficulty in making decisions and may take unwise steps because of not having sufficiently broad counsel and advice on the most progressive or far-reaching methods of furthering the mental health program of his state.

This meeting today is evidence that state governments are showing increased interest in the problems of mental health. The publication by the Council of State Governments of two volumes on mental health is an outstanding contribution to the problem of prevention, as is also the volume on "Mental Health in the United States," published in the *Annals of the American Academy of Political and Social Science*. I wish abstracts of all these articles could be made available to all the governors. The articles by Felix, Barton, Gruenberg

and Frank point out where we are, what our needs are, and where we can move more constructively. It has been my pleasure to read two other remarkable articles, both putting psychiatry succinctly in understandable, helpful discussions. One is called "Why You Get Sick," by F. G. Slaughter, M.D.;* the other, published by the American Psychiatric Association Committee on Civil Defense (Calvin Drayer, Chairman), is "Psychological Aid in Stress and Disaster."

The need for doing a more efficient job of treatment and prevention in the mental health field is underscored by the appalling cost to the community of mental and emotional illness.

The *state governments* spend in tax funds approximately

$365,000,000 on maintenance of state mental hospitals
$150,000,000 on capital costs
$ 45,000,000 for other mental health services

$560,000,000

The *federal government* spends about

$121,000,000 on maintenance of veterans' psychiatric hospitals
$ 7,000,000 on the veterans' psychiatric services
$420,000,000 in compensation or pension for veterans' psychiatric disorders

$548,000,000

If we add loss in earnings and productivity, the cost to the country per year reaches an estimated five to six billion dollars. This figure is increasing each year. There is an annual increase of 16,000 admissions. Unless the trend can be reversed by preventive measures, according to conservative estimates, over 100,000 more beds will be needed in 10 years. The cost of construction of such facilities will be an added $1,200,000,000.

This is big business. But America is capable of managing big business. An undertaking of such magnitude in business would not tolerate the meager staffs and inadequate salaries that are paid in the several offices of states to supervise and guide, wisely, progressively, and efficiently, the expenditure of such sums. They would pay high salaries and obtain adequate personnel to do the job all the way through the system, down through the state hospitals themselves. They would study the savings that could be made and would determine where concentration of effort and skilled personnel counted most in order to increase the quality, quantity, and serviceability of the product. Large corporations have found that it pays to give adequate wages and salaries. They recruit sufficient numbers of personnel adequate to the job. They pay attention to the health, welfare, and morale of their employees. These factors receive too little attention in connection with the staffs in state mental hospitals. Inadequate wages and salaries, poor living conditions, circumscribed, isolated environments, overwork, frustration and harassment. These are the conditions in which the majority of the mental hospital staffs work. It is remarkable that many of them do such a progressive job.

* Faith Today, February-March, 1954.

The isolation of mental hospitals is unwise and unwholesome from many points of view. First, when mental hospitals are located in or near cities they can avail themselves of the many advantages of university, medical, or other academic activities. Skilled consultants can readily be obtained. There are opportunities for guest lecturers to train the staff, special diagnostic procedures, interchange of staff personnel with the mutually beneficial experience, and a general atmosphere of intellectual stimulation. Many able staff members leave state hospitals because of the lack of these opportunities. For example, a great many psychiatric residents want psychoanalytic training, which can now be obtained only in the large cities. The insights and understanding into psychodynamics that can be furnished by the psychoanalysts are too rarely available to the staffs of the state hospitals. It is recommended that psychoanalysts be asked to take part in staff conferences and training programs. A second disadvantage of the isolation of mental hospitals is that it is difficult for relatives to visit patients. Isolation marks the institution off as something unrelated, mysterious, and awesome. It is poor mental hygiene. Recovering patients and convalescents cannot readily visit and partake in community activities and part-time work in visits to their customary milieu. The superintendent and staff and their families and children should be integral members of the normal community as human beings, participating in the various aspects of community life—schools, churches, clubs, neighborhood relationships, and recreational facilities.

But return to the budget. Notwithstanding the handicaps of difficult and frustrating conditions of work, many of the state hospitals have been performing an increasingly effective job. The reduction in the length of residence, when newer intensive treatment methods are available, constitutes an enormous economic saving. When 60 or 70 per cent of new admissions are returned to the community within six or eight months as compared with older figures, the saving to society is obvious.

Intensive newer methods and early treatment in the mental hospitals are not the only ways of saving. Adequately staffed outpatient clinics can reduce significantly the admissions to hospitals. The Boston Psychopathic Hospital study of their outpatient clinic demonstrates this. There is great financial saving. Of 1,100 outpatients seen during one year 175 were saved from hospitalization. The state thereby saved $551,000 by spending only $80,000 for the expense of the clinic. Imagine what saving this would be if such a clinic were available to each unit of 100,000 population. These services should be available throughout the country.

General hospitals, especially medical school teaching hospitals, should have psychiatric services and outpatient clinics. All of this would reduce the load on state mental hospitals and decrease the requirements of new bed construction, facilities and necessary personnel. A study reported that in 111 general hospitals with psychiatric facilities, of 128,000 patients treated, 85,000 or 66 per cent were discharged to the community.

All this is business and economics. It points to new lines of attack on this terrific problem. Concentrate on men, not buildings! I believe from the data available, that an increase in personnel, especially of psychiatrists, not only in the state hospitals but in the general hospitals and clinics throughout the country, would save money and suffering.

There are three essential ingredients of the mental health program—adequately trained personnel, facilities, buildings. Of the three, personnel is the most critical. If any state had in its hospitals and clinics the personnel it should have according to the standards of the American Psychiatric Association, the amount of building construction could be greatly reduced. We operate within a framework of frustration and pessimism. Suppose instead of relieving a situation by building construction, one used one to two million dollars to employ more psychiatrists and other personnel. Suppose that with this personnel it became possible to provide an active treatment program with different kinds of therapies, from the moment the patients got up in the morning until they retired at night. Then suppose overcrowded wards were used only for sleep. In short, suppose our whole emphasis changed from trying to find more space for custodial care to devising better treatment in order to get the patient well and out of the hospital. Would we not then be acting on a presumption of optimism?

Enough has been said to indicate that we have been dealing with the mental illness problem in this country with a sense of frustration, futility, and confusion. Out of desperation, patchwork, stop-gap methods have been employed. There has been no long-term, systematic, scientific, sociological, business man's study of this problem. This runs contrary to the American way of doing things.

The greatest frustration of the psychiatrist as a physician, and a great tragedy from the humane point of view, is that the majority of the state mental hospitals are omitting or greatly limiting the use of the more successful methods of treatment chiefly because of the lack of staff and facilities. Imagine what it would be like if you were a physician and could not give insulin for diabetes, liver extract for anemia, or penicillin for peritonitis. This is the practical situation of the psychiatrist today in the state hospitals. This is unbusinesslike, it is uneconomic, and it is inefficient. Over $500,000 has recently been spent on the study of hospital care and its financing. A similar study is indicated for the catastrophic problem of mental illness. It might be hoped that the Council of State Governments would take the initiative in such a vital move.

Man has changed the concept of destiny and fatalism in thinking of disease. This change has come through *research*. Pneumonia, diphtheria, typhoid fever are no longer the leading killers: heart disease, cancer, cerebral hemorrhage are the chief killers today. There is a shift in the medical picture to degenerative and stress diseases. This opens whole new fields of research, into the activities of cortisone and ACTH for example, and into the relation of emotional tension and mental, psychological, and social stresses on the chemistry of the body and the production of disease. As Slaughter says, "With millions of people sick every day from disease in which emotions are the main criminals, it is important to find out just why this has happened." A new field of psychiatric research is crying to be explored for the benefit of society. Psychiatric research has lagged. *Not one of the new major effective methods of psychiatric treatment has been discovered in this great country of ours.* Research is one of the greatest needs in a positive program of prevention in the field of mental health. We need not passively accept a fatalistic approach to mental illness. So-called destiny can be demonstrably changed by man. We are proposing a changed point

of view—from defeatism and pessimism to optimism and challenge. Toynbee says, "Civilizations survive which respond constructively to challenge." If the H-bomb is released and civilization destroyed it will be because we have not learned enough, through research, about the sources and control of fear, friction, hate, distrust, desire for power, aggressiveness, and hostility—the psychologic factors that contribute so heavily to mental and emotional illness both in individuals and societies. Adequate research is one of the cornerstones of a positive program of mental health.

A positive program would include important changes both within our mental hospitals and outside in the community. Within the hospitals our shortsighted methods are actually maintaining and prolonging mental illness unnecessarily. We are paying for this in dollars. Money is going down the drain. But worse than that we are paying in human suffering.

Within the hospitals a constructive program should emphasize personnel, so that dynamic modern treatment can take the place of sterile custodial care.

If we think of mental health as something more than merely the absence of mental disease, we must turn at once to *community activities and responsibilities* outside the walls of mental hospitals. If mental health is thought of as the capacity to enjoy satisfying and satisfactory relationships with family and friends and progressively to develop one's full potentialities in work and leisure-time activities, then one sees *mental health as a level of living* which can be indefinitely raised. From this point of view, almost everything that happens to a person in his personal, vocational, and social relationships has a bearing on the level of mental health. All community activities have some such impact.

Of fundamental importance is the strengthening of family life. From the love and protection of their parents children get their initial sense of security and feeling of adequacy. Through the training and emotional support of parents, they learn successfully to overcome difficulties, to achieve, and to get along with other people, to lay foundations for mental health. The family is in a key position. Through many channels the hands of parents can be strengthened—through marriage, family and vocational counselling services, through mental hygiene study groups, through child guidance clinics.

From the age of 6 on, for many years, most children spend about a third of their waking hours in school. If the teacher does not feel herself secure, she is not likely to add to the feeling of security of the child. A teacher who is underpaid, who may be fired for political reasons, or who automatically loses her job if she dares to marry, is not likely to be a secure person and consequently unlikely to pass on emotional security to the child she teaches. This, then, constitutes one kind of impact for good or bad that the community cultivates or brings to bear on the level of mental health of its citizens.

If *recreational facilities* and the opportunity to do useful and enjoyable things in contact with contemporaries are available to all groups, but especially to the aging, people are likely to be much happier than if they feel themselves outmoded with no place in the community. Their mental health suffers, and they may have an unwholesome, deleterious impact on their children and their grandchildren with whom they live. Today the average adult in our country is over 42 years old and by 1960 he will be over 45. Before long half

of the people of voting age will be in the social category as yet unrewarded by our culture. Growing old is now a most unrewarding aspect of American life.

If *courts* recognize emotional problems and deal with juvenile delinquency and domestic relations with the awareness of their psychologic and psychiatric implications, they will do a more effective job than if they ignore this area. When a better job is done by the courts, the general level of mental health in the community is raised. We should *mobilize community resources*—recreational and social agency facilities—to deal with the problems of juvenile delinquency and to give support to parents rather than blame or condemn them so universally. *Industry* with its growing awareness of the importance of emotional problems among its personnel is carrying out a real service toward improving the level of mental health. The *church*, alert to these problems, can also make contributions to mental health. Devotion and dedication to ideals and goals beyond oneself and to others, expand one's individuality and increase one's mental health.

Thus we do not have to be puppets passively accepting our fate. Destiny and fate are concepts we can change. The growth of civilization and culture presents an increasing modification molding and controlled of circumstances and conditions. They can be changed, as we have seen, physically, geographically, industrially, socially, and medically. We must accept this challenge for change and create a new destiny for the dire problem of mental illness in our states.

New community resources can be developed and expanded. Facilities are required for treatment before hospitalization; services and clinics in large general hospitals, rehabilitation and follow-up centers to tackle the problem of recurrence of illness after discharge, should be established. The use of day hospitals should be developed, health centers as well as recreational centers. There should be psychologic emphasis on prenatal and well-baby clinics, in counselling centers for those intending to marry, and for families. Courses should be initiated, such as exist in the Dept. of Mental Health at the Massachusetts Institute of Technology. Better education for nurses—general duty, public health and visiting nurses—should be encouraged. There should be more help for medical schools, universities, and teaching hospitals to train more psychiatrists, social workers, psychologists, nurses, and psychiatric aides. Increase of salaries for staff physicians in mental hospitals, so that their work would be attractive and comparable to the income that can be obtained outside of state hospitals, is essential. Is there any reason why states should not require young physicians before they obtain licensure to devote four to six months to state hospital service? The states in most instances make large contributions to their medical education. They will earn their livelihood out of the communities in which they practice. It would make them better practitioners of medicine. It would fill a gap in the personnel of state hospitals. Finally, special fellowships should be made available for the training of psychiatrists, the most prolonged and expensive training required of any profession. Much is lost in the field of mental health when many of the younger men frequently have to perform two jobs to finance this expensive training. At the time when they should be free for creative thinking, research, and raising families, they are bowed down with great burdens.

ABSTRACTS

psychiatry

ADMINISTRATIVE PSYCHIATRY AND LEGAL ASPECTS OF PSYCHIATRY

For Reference Only

131. *On Freedom and Responsibility of the Mentally Ill (Ueber Freiheit und Verantwortlichkeit von Geisteskranken I).* W. VON BAEYER, Nürnberg. Nervenarzt. *25*:265, July 20, 1954. 14 references.

CLINICAL PSYCHIATRY

132. *Emotional Significance of Severe Trauma.* BENEDICT NAGLER, Washington, D. C. Virginia M. Monthly *81*:152–155, April 1954.

The emotional reaction to trauma manifests itself in fear, anxiety, doubt about the future, correct knowledge or exaggerated concept of the duration of the incapacity, and realization of the permanency of the affliction. Hopelessness or unjustified hope of return of function may be expressed. Thoughts come about disfigurement and fears of the impossibility of ambulating, being active, working, and being able to fulfil and enjoy the sexual role. The contacts with society, the family group, and the community are at stake. Added is the economic threat. Anxiety and "acute grief reaction" are normal. If the patient can overcome these he can be led to acceptance of his disability and constructive thinking for the future, but if he cannot, we may find:

1. *The Neurotic Reaction.* The initial anxiety and apprehension may become a pattern of behavior and eventually a way of life. The patient may become disproportionately depressed, with suicidal preoccupation, or the duration of the initial grief reaction may become excessive. Obsessive-compulsive reactions are sometimes observed, manifested by preoccupation with disfigurement, loss of function, and disability. Unconscious exaggeration of the significance of the trauma may lead to conversion symptoms, which add pseudophysical signs to the aftereffects of the injury, not to be confused with conscious attempts to exaggerate the symptoms nor with malingering. Although these reactions are more often seen when compensation, pension, or litigation are involved, we find them also in patients who are free from problems of "secondary gain." Thus, there are four "neurotic" reactions, namely, anxiety, depression, obsessive-compulsive behavior, and conversion. They are characterized by increase of the normal emotional symptoms, reaching proportions that incapacitate beyond the usual degree and beyond the usual period of time, or by a change of the fears into pseudo-organic manifestations.

2. *The Psychotic Reaction.* The individual, stunned by his physical impairment, disfigurement, and disability, defends himself against the hostile surroundings by breaking with reality. Some show a psychotic depression, others paranoid reactions; some may withdraw into the mutism and immobility of the catatonic. Others overcompensate their feelings of insecurity by the overactivity of the manic.

3. *The Aggressive Reaction.* The patient, insecure because of his impairment, "hits back" at the outside world. Emotional instability, quick change of his mood, temper tantrums, freely expressed hostility, agressiveness, and uncooperativeness with the physician and his co-workers are the symptoms and signs.

4. *Escape Reaction.* The patient wants to flee from the situation, running away from the family, hospital, or both, sometimes with excessive use of alcohol to "forget."

5. *The Dependency Reaction.* This patient "does not move." He wants to stay indefinitely under the protection of the hospital, depending on the "father doctor," "mother nurse," or the hospital as "parents at large." He refuses to meet society and its challenge. A very dangerous dependency reaction is that of drug addiction. Relief by medication becomes the outward expression of protection by the father and mother figures. We physicians in our desire to help sometimes overdo the relieving of pain or may fail to set the right "cut-off" date and so unintentionally cause the patient to become addicted.

6. *The Reaction of Indifference.* The patient is not actively aggressive, not hostile, does not show anxiety, does not retreat into unreality, but does not do anything positive, either. Some take refuge in alcohol. These patients, presenting some of the most difficult problems, are in reality depressed to such a degree that they show complete lack of drive and zest for living.

The Desirable Reaction. The patient accepts his disability, understands his limitations, liabilities, possibilities, and remaining assets, and plans for the future, cooperating with the medical staff, the family, and the community.

We help the patient to reach such desirable attitudes by trying to understand his reactions and mechanisms and by accepting some of the undesirable reactions. We treat not the disease but the individual. We have to push one person and restrain the other, according to his individuality and not according to his disease. We try to see with the patient's eye, seeing his possibilities in spite of his severe impairment. We provide an outlet for drive in activities in which the patient can compete or excel. We give the patient a chance to compensate for his deficiencies and sublimate his aggressive drives by mental endeavors, by activities in occupational therapy, by painting, writing, producing, being creative. We have to allow the patient to regain his prestige in the economic, social, and sexual spheres: in the *economic* sphere, by showing him ways in which he can use his capabilities; in the *social* sphere, through recreational activities in which he can participate; and in the *sexual* sphere, allowing him to sublimate by other activities those drives that are impossible to fulfil.

133. *Evaluation of Suicide Attempts as Guide to Therapy; Clinical and Follow-Up Study of One Hundred Nine Patients.* EDWIN H. SCHMIDT, PATRICIA O'NEAL, AND ELI ROBINS, St. Louis, Mo. J. A. M. A. *155*:549–557, June 5, 1954.

Over a period of five months, 109 of the 120 consecutive patients who were brought to a

large municipal hospital because they had made an unsuccessful suicide attempt were studied intensively.

A follow-up study of these 109 patients, done eight months after they were originally examined, revealed that 2 patients (2 per cent of the entire group) had successfully committed suicide within four months of the time they had made their unsuccessful attempt. Since both of these patients had a treatable or self-limited disease, their deaths were preventable.

Prior to the time of follow-up, the patients were divided into two groups based on the seriousness of their suicide attempt. The *serious group* was composed of 35 patients whose attempt resulted in a medically or surgically serious condition or whose intent was considered serious by the psychiatrist. The *not-serious group* was composed of the remaining 74 patients whose attempt was not serious either on the basis of physical findings or of intent.

The two patients who subsequently successfully committed suicide were in the serious group (6 per cent of the 35 patients), and no patient in the not-serious group subsequently committed suicide. The fact that these results correlated so well with the evaluation of the seriousness of the original unsuccessful suicide attempt leads us to believe that this study might be a first step in developing criteria for determining the subsequent risk of successful suicide in patients who have made an unsuccessful attempt.

The diagnoses in these patients were arrived at by the conventional clinical method, that is, the use of history, examination, and relevant laboratory data, which any physician should be able to use without special training.

In patients with a manic-depressive depression or a dementia (vascular disease of the brain or senile psychosis) who have made a suicide attempt the risk of a subsequent successful suicide is probably great, whereas in patients with psychopathic personality or chronic alcoholism the risk is probably small.

Other findings besides the diagnosis that were helpful in distinguishing a patient in the serious group from one in the not-serious group included differences in mental status examination and in statements by the patient concerning the seriousness of his attempt and the reasons for it.

The findings listed above that seem most helpful in differentiating the serious patient from the not-serious patient are those that are readily obtainable while taking a history and observing the patient. While some clinical knowledge of psychiatric disease is indispensable to a proper evaluation of these patients, special technics and training are not needed.

The 109 patients were in 10 different diagnostic categories, indicating that attempted suicide is a symptom of many different psychiatric illnesses. However, two thirds of all the patients were in only five diagnostic groups: manic-depressive depression (including involutional melancholia), psychopathic personality, chronic alcoholism, hysteria, or dementia (vascular disease of the brain or senile psychosis). There was no patient with an anxiety neurosis or with a psychoneurotic depression in the entire group.

Many patients, especially those with psychopathic personality, make repeated suicide attempts. It is the impression of the authors that all the serious patients who have attempted suicide should be hospitalized, whereas the not-serious patients who have attempted

suicide should rarely be hospitalized, unless they have a manic-depressive depression or a dementia.

The results of this study suggest that it would be of value to continue the present type of study and to extend it to other patient groups. 9 references. 6 tables.—*Author's Abstract.*

134. *Conflicts Between Psychiatry and Religion.* GEORGE CHRISTIAN ANDERSON, New York, N. Y. J. A. M. A. *155*:335–339, May 22, 1954.

Although concern is often expressed that psychiatry is "irreligious," an examination of the facts suggests a growing appreciation among religious groups of psychiatric insights. Many principles of Freudian psychoanalysis are unacceptable to several major religious groups, chiefly because of Freud's teachings concerning God as a mere "father image." However, Freudian psychoanalysis is but one facet of psychiatry; many psychoanalysts disagree with certain major tenets of Freud. Biologic research in the etiology of psychiatric illness, and the contributions of cultural anthropology and psychology, provide significant data concerning mental health. The search for mental health involves at least a three-dimensional aspect; investigation of the psyche, investigation of relationships between psyche and soma, and consideration of the relationships between the psyche and soma when they are in conflict with social environment.

Religious groups are interested in obtaining insights concerning emotional behavior from the various aspects of psychiatric investigation. All psychoanalysis is not rejected; Pope Pius XII has approved psychoanalysis, provided the faith of the Roman Catholic Church is inviolate. Clergymen of many faiths now receive special training in mental health. Seminaries are introducing courses in pastoral psychology. Several thousand clergymen have received clinical training in mental hospitals. Informed clergymen can be of help in the fight for mental health. Training in psychiatric insights enables clergymen to recognize their limitations in attempting to deal with emotional problems and thus make adequate referrals. A better understanding of the unconscious suggests opportunities for clergymen to restudy the doctrine of free will and moral responsibility. Traditional theologic attitudes may need revision. Goals of religious groups and psychiatry reveal marked similarities; both disciplines strive to improve interpersonal relations within the framework of the social environment in which the person is living. Many psychiatric principles and goals have spiritual overtones; religion and psychiatry both seek maturity in the individual. Psychosomatic medicine, enlightened by psychiatry, opens new opportunities to religion; religious groups, by stressing moral and spiritual values, influence physical and mental health. Certain religious groups question the morality of lobotomy. Theologic and philosophic principles are involved in any effort to change personality radically. This subject needs further study.

Major conflicts between psychiatry and religion are chiefly on philosophic and theologic levels. The many varieties of religious beliefs make difficult efforts to find philosophies mutually acceptable to psychiatry and theology. Theologians must resolve many of their own differences concerning basic religious concepts before others engaged in mental health can determine what values theology and psychiatry have in common. Some religious experiences do not contribute to emotional good health. Many enlightened clergymen look

with concern at certain pathogenic tendencies and disease-aggravating tendencies in the attitudes held by certain religious groups. Many religious values and teachings have positive value in psychotherapy. Life must have some meaning that can be understood in universal terms. It is difficult to presume that man, a created being, has no relationship with a creative force. The study of mind, body, and social environment suggests three dimensions of mental health; perhaps a fourth dimension can be added, man's relationship to the universe. The search for knowledge concerning this fourth dimension may be the most profound of all. Both religion and psychiatry need to examine their values, goals, and assumptions before total agreement can be expected between these disciplines. Because of the vast membership in religious bodies, religion with enlightened clergymen can exert an enormous influence in establishing good mental health patterns. Religion informed by psychiatry, and psychiatry utilizing certain religious values, may be able to lead mankind into a much higher level of health. 5 references.—*Author's abstract.*

135. *Delusional Reduplication of Parts of the Body.* EDWIN A. WEINSTEIN, ROBERT L. KAHN, SIDNEY MALITZ, AND JULES ROZANSKI. Brain. *77*:45–60, March 1954.

Four patients are described who had delusions of reduplication of parts of the body. One patient with a left hemiplegia stated that she had two left arms, one of which was said to be paralyzed and to belong to a friend, while the other functioned normally and was claimed as her own. Similar delusions were expressed by the other patients in whom multiple eyes and several right extremities and heads were reported.

All the patients had diffuse brain pathology of rapid onset associated with a bilaterally slow wave EEG record. Two had sustained severe head injuries, another had developed meningoencephalitis following removal of a cerebellar astrocytoma, and autopsy in the fourth patient showed destruction by a vascular lesion of almost the entire right cerebral hemisphere. Although a change in brain function was necessary for the existence of the delusion, the member of the body that was reduplicated was not necessarily disabled by a neural lesion. In 1 patient a limb had been fractured, and another, who stated that he had multiple eyes, had had an enucleation years previously. In 2 patients whose delusions had cleared, they could be elicited again when the patient was questioned under the influence of sodium amytal.

Reduplication of body parts was accompanied in all the patients by other reduplicative phenomena. These were reduplication for place (reduplicative paramnesia of Pick), in which the patient states that there are two hospitals of the same name, and reduplication for time and person. In the latter forms, the patient states that a present event has also been experienced in the past and that an actual person is also someone else.

The phenomena of reduplication are closely related to anosognosia (lack of knowledge of the existence of disease). In this condition the reduplicated part of the body is always a disabled one, and the "extra" member is presented as a healthy one. Reduplication thus serves as a symbolic vehicle for the denial of illness, and the relation of motivational and physiologic factors is much like that which exists between dreams and sleep. The study provides evidence against the conventional theory of "body scheme," in which anosognosia is regarded as a disruption of the body image represented in the cerebral cortex. The phe-

nomena are explained not by a lesion of any portion of the cortex but as a reorganization of the perceptual-symbolic function in which parts of the body, places, objects, times, and persons are used to express individual motivations. 30 references.—*Author's abstract.*

136. *The Long Term Evaluation of Prefrontal Lobotomy in Chronic Psychotics.* R. F. MEDINA, J. S. PEARSON, AND H. F. BUCHSTEIN, Willmar, Minn. J. Nerv. & Ment. Dis. *119*:23–30, January 1954.

A group of psychotic patients hospitalized an average of 13 years prior to lobotomy were individually matched at the preoperative level with a group of control (nonsurgical) patients in the same state hospital. The matching procedure took into account race, sex, age, diagnosis, period of institutionalization, age at time of commitment, education, marital status, and occupational level. The evaluation on a six point social recovery scale was conducted eight to nine years after surgery. Approximately 50 per cent of the total number of patients operated upon achieved the two highest behavioral ratings, whereas only 4 per cent of the controls reached this level. Only 7 per cent of the experimental patients remained the same or became worse, in contrast to 88 per cent of the control patients. Subdivision of the two groups by reaction type (schizophrenia and affective psychosis) showed a much greater degree of improvement for the experimental group in both categories. Within the control group the affective disorder patients showed a slight degree of improvement without treatment, whereas the schizophrenics had become somewhat worse. Of the experimental patients showing the greatest degree of improvement on the recovery scale, 60 per cent reached their adjustment peak within five years, while the remainder continued to improve up to eight years postoperatively. In some cases there was a regression in behavior, apparently independent of aging effects, where a high adjustment level had been maintained for several years postoperatively. There was no relationship between degree of improvement and sex, nor between improvement and the presence or absence of convulsions. The poorest recovery rating was for experimental patients with the earliest age of onset of psychosis and for those hospitalized the longest prior to surgery. Psychologic test results were essentially negative, with only the Picture Arrangement test of Wechsler and the Porteus Maze performance differentiating the two groups, in each instance favoring the control group. It was suggested that there is a permanent deficiency in the particular area tapped by these tests—the ability to look ahead planfully and size up meaningfully total aspects of social situations. 9 references. 3 tables.—*Author's abstract.*

137. *Work Adjustment Five to Ten Years After Bilateral Prefrontal Lobotomy; Follow-up Study of 86 Patients with Chronic Mental Disease.* MILTON GREENBLATT, MARIE WINGATE, AND HARRY C. SOLOMON, Boston, Mass. New England J. Med. *250*:856–860, May 20, 1954.

A follow-up study of 86 patients who received bilateral prefrontal lobotomy (Poppen's technic) between October 1943 and April 1946 was undertaken to determine the effect on work capacity 5 to 10 years after operation. All were chronically ill psychotic patients whose progress without operation was considered hopeless. The specific focus of the study was to determine not only how much improvement followed lobotomy but also whether the improve-

ment was sustained over the years, and especially how the postoperative level compared with the preoperative level of work capacity both before illness and during illness.

The findings indicate a vast improvement of work adjustment after operation. However, the postoperative level was considerably below the best work period—before the illness had begun.

The work adjustment of patients who were in the community at the end of the follow-up period of 5 to 10 years was considerably higher than that of the hospitalized patients and nearly up to the level before illness. However, hospitalized patients made significant gains in work adjustment compared with the preoperative level. The postoperative adjustment of housewives was very satisfactory, considering their uniformly poor work adjustment during illness. (All had been efficient housewives before illness.)

Comparison of the improvement figures in a follow-up study of one to four years with those in the present 5 to 10 year survey reveals, generally, maintenance of improvement level over the years; for hospitalized cases there is a strong suggestion that the work adjustment was better in the later than in the earlier follow-up study.

The results are encouraging as an indication for further use of the lobotomy operation. The patients operated on were those whose work potential had been crippled by the illness. The operation succeeded in releasing to a greater or lesser degree the work potential of a substantial number of these patients both in the hospital and in the community. 4 references. 3 tables.—*Author's abstract.*

For Reference Only

138. *The Fundamental Nature of the Distinction Between Normality and Neurosis.* LAWRENCE S. KUBIE, New York. Psychoanalyt. Quart. *23*:167–204, April 1954. 22 references. 2 figures.

For Reference Only

139. *The Clinical, Pathogenic and Therapeutic Aspects of Mental Anorexia* (*Les Aspects cliniques, pathogéniques et thérapeutiques de l'anorexie mentale*). J. LABOUCARIE AND P. BARRÈS. Evolution Psychiat. *1*:119–146, January–March 1954. 16 references. 5 pages statistics.

GERIATRICS

140. *Community Conditions and Psychoses of the Elderly.* ERNEST M. GRUENBERG, Syracuse, N. Y. Am. J. Psychiat. *110*:888–896, June 1954.

This is a progress report on one of the studies in community aspects of mental health problems being conducted by the New York State Mental Health Commission's research unit in Syracuse, N. Y.

This article describes a study in which 483 first admissions to mental hospitals of people over 65 years of age were allocated to the census tract of residence at the time of hospitalization. The study was confined to patients with cerebral arteriosclerotic and senile psychoses. It covered the period from 1935 to 1944.

Of the 61 census tracts in Syracuse, 52 had populations large enough for analysis. Of these, 10 were found to have a consistently larger number of admissions than would be expected were the cases distributed as was the population over 65. Six of these were in the lower socioeconomic areas of the city, but 19 other tracts equally low on a socioeconomic scale did not have consistently high admission rates (higher than the city-wide rate).

Evidence is presented tending to show that there is in the center of the city an area characterized by high rates of first admissions to mental hospitals for cerebral arteriosclerotic and senile psychosis, by high rates of first admissions to mental hospitals for all the other psychoses taken as a group, by high concentrations of multiple family dwellings, and by high percentages of people living alone.

Points for further investigation are outlined. 5 references. 3 figures. 5 tables.—*Author's abstract.*

HEREDITY, EUGENICS, AND CONSTITUTION

141. *Some Antecedent Factors in the Family Histories of 392 Schizophrenics.* C. W. WAHL, Boston, Mass. Am. J. Psychiatry. *110*:668–676, March 1954.

In this study an attempt was made to find the frequency with which certain antecedent factors entered into the life histories of a large group of schizophrenics. These factors were selected because they seemed to be clinically preeminent and often to be dynamically related to the genesis of the subsequent psychosis. The antecedent factors chosen, in order of their clinically estimated importance, were: 1. marked rejection and/or overprotection by one or both parents; 2. death, desertion, or divorce of the parents; 3. intense sibling rivalry; 4. ordinal placement in the sibling hierarchy; 5. membership in a family of more than average size; 6. membership in various religious groups.

The applicable case records of consecutive admissions to the Elgin State Hospital from June through December 1940 were utilized for this study. This paper is concerned with the 392 schizophrenics of this sample.

Of the males of the sample, 24 per cent were oldest children, 23 per cent youngest, 16 per cent next to youngest, and 11 per cent only children. All other placements constituted 25 per cent. No placement in the sibling order shows conspicuous cluster in any of the schizophrenic subtypes. These data do not seem to lend support to the hypothesis that increased vulnerability to schizophrenic illness results from specific placement in the sibling order, although in individual cases the significance of this factor seemed indisputable.

According to Dublin, in American families that have children, the average number is 2.2. In the schizophrenic group the family size is consistently larger than the national average: in the general population, 13.7 per cent of families have four or more children; of the males of this sample, 52 per cent came from families having four or more children. It was felt that in contrast to the purported advantages of large family membership there might be the disadvantage of spreading the paternal affection too thinly, diluting it into ineffectiveness and so intensifying the child's sibling rivalry in fears of abandonment and rejection.

The distribution of religious affiliation appeared to correspond roughly to that of the general population from which the patients were largely drawn.

Although there are many ways in which parents' attitudes toward their children may be pathologic, parental rejection and overprotection were chosen in this study because they seem to be preeminent clinically and because they could be more readily ascertained from the record than could other more poorly delineated parental attitudes.

Of the 392 subjects, 48 per cent came from homes in which there was severe rejection, overprotection, or both by one or both parents. This total comprised 55 per cent of the male group and 31 per cent of the female. The much higher incidence among the males suggests that there are factors other than constitutional accounting for the well known preponderant incidence of schizophrenia among males. It was also noteworthy that in this group antecedent parental rejection and overprotection are not limited to either the same or the opposite sex parent. Thirty-three per cent had been rejected by one or both parents, whereas only 17 per cent were overprotected by one or both parents. Because of the varied size of the subtype samples it was not possible to draw any conclusions regarding the relationship between specific patterns of parental attitudes in any given subtype of schizophrenia. The much larger incidence of pathologic parental attitudes in the hebephrenic subtype was thought to indicate a relationship to this more severely regressed form of the illness.

The incidence of parental death among the general population has been determined. According to Fisher, orphans comprise 6.3 per cent of the general population 18 years or younger. Of this schizophrenic group 23 per cent were orphans before the age of 15; this is roughly four times the number in the general population. In this group 46 per cent of the schizophrenic orphans had lost a father, 36 per cent a mother, and 18 per cent had lost both. Among orphans under 18 in the general population, 63 per cent had lost father only, 34 per cent mother, and 3 per cent both. In the schizophrenic group the incidence of paternal loss by separation is greater than any other kind of loss, and this is true for both males and females. This appears to indicate that relationship to the father plays a role in the development of the child, both male and female, which has not been adequately appreciated or understood. In the histories of 17 per cent of the subjects there was evidence not only of marked rejection and overprotection but of loss of one or both parents by death or separation before the age of 15. It was a consistent clinical impression that these incidents of double trauma were related to an early onset and special severity of the psychotic process.

Of the 392 patients in the group only 12 per cent had a history of no parental rejection and overprotection or parental loss before the fifteenth year. The percentage of the schizophrenic group that was orphaned in each five year period from birth to the age of 15 was 33 per cent in each case. The even distribution of parental loss by death among the three age groups appears to indicate that this trauma of death is not so exclusively limited to the earlier years as had been supposed. In both male and female groups loss of the father during each five year period was roughly double that of the mother.

The relevance of these data to the theory of identification and magical problem solution is discussed, with particular emphasis on the phenomena of death as it affects children and is conceptualized by them. The possible relation of this trauma to the development of subsequent neurosis or psychosis was considered.

A possible conclusion that can be drawn from the high incidence of parental death found in this group is that schizophrenic illness is a protection against strong feelings of helplessness and worthlessness, serving to protect the patient from further arousal of overpowering feel-

ings of guilt and anxiety which were associated with his earlier interpersonal relations. The human needs that are ordinarily resolved by nonpsychotics by a process of learning through "good" and "identification," persist unabated in the schizophrenic. His great anxiety regarding his feelings of unworthiness and inadequacy makes the ordinary cultural resolution of his needs difficult, so he is driven to their resolution in fantasy. The longer he practices fantasy gratification, the greater becomes the withdrawal from attempts to master reality, and the more satisfying and more real becomes his make-believe world.

It would thus seem that one of the mechanisms of therapy needed with schizophrenic patients is the demonstration of consistent interest, encouragement, and regard, which serve to reduce anxiety and guilt regarding a close relationship with real individuals in the patient's environment. In this climate the therapeutic work can proceed. Within this medium each new success in the identification process reduces the patient's anxiety and guilt while heightening his self esteem, with the result that dereistic gratification becomes less necessary and attractive.

The factors found in this study are probably not specific for the genesis of schizophrenia. The high incidence of parental loss, has been found in other groups, and it must also be remembered that the same early factors do not always and necessarily produce an individual who becomes a social problem. Later influences and a shift to a better environment in the adolescent years may often counteract the earlier disadvantages of parental loss or lack of interest. 22 references. 3 tables.—*Author's abstract.*

PSYCHIATRY OF CHILDHOOD

142. *The Organization of a Training Program for the Cerebral Palsied in an Institution for the Mentally Deficient.* DONALD E. BOWLUS, Spadra, Calif. Am. J. Ment. Deficiency. *58*:419–423, January 1954.

Students for a new school program for the cerebral palsied in an institution for the mentally deficient were selected on the basis of their ability to communicate well enough to participate in group activities. Classes met for one hour daily in cottage dining rooms or day halls. An initial period of exploration to determine suitable activities led to the formation of a regular weekly routine, including days for reading, numbers, music, art, and other experiences. The organization of the program was made according to the following principles: 1. students are selected in terms of their ability to participate in group situations; 2. class periods are short and frequent to prevent fatigue reactions; 3. individuals are carefully appraised before planning group work; 4. the familiar routine, once established, is seldom varied; 5. the academic program is diversified within the limits of the school routine; 6. the cerebral palsy program is combined with other school activities whenever possible. Goals of the program include arresting mental deterioration, fullest use of individual capacities, stimulation of active rather than passive attitudes, and improvement of social adjustment. *Author's abstract.*

For Reference Only

143. *The Psychiatrist and Learning Difficulties (Le Psychiâtre devant les difficultés scolaires).* PIERRE LUQUET. Evolution Psychiat. *1*:53–73, January–March 1954.

PSYCHIATRY AND GENERAL MEDICINE

144. *Depression in Psychosomatic Disorders.* SIMON ROTHENBERG, Brooklyn, N. Y. Psychosom. Med. *16*:231–239, May-June 1954.

This paper describes the clinical picture and psychodynamics of the frequent occurrence of depression with psychosomatic disorders. Psychosomatic symptomatology in primary depression is a common finding, but the reverse manifestation of depression in psychosomatic conditions, though less frequent, is nevertheless a distinct clinical entity that has not been sufficiently recognized. It can be differentiated from the type of acute psychotic depression occurring paradoxically subsequent to the dissolution of severe psychosomatic disorders by its benign character and its concomitance with psychosomatic symptoms. Alleviation of the latter condition usually relieves the depression.

In the analysis of several cases of this conjoined condition, many complex symptoms were clarified by viewing them in the light of superimposed emotional conflicts between ambivalent feelings of love and hate, and unconscious death fantasies. Insight into the psychodynamics of allergic cold reactions, angioneurotic edemas and urticarial eruptions, pruritis ani, and persistent psychogenic abdominal pain was obtained from the material of the cases reported. Theoretic perceptions of the meaning of psychosomatic disorders in terms of physiopsychic mechanisms are described. Likewise, depressions are defined according to more recent theoretic elaborations. 13 references.—*Author's abstract.*

145. *Description and Treatment of Heart Disease Due to Anxiety.* JACKSON A. SMITH AND DON W. CHAPMAN, Houston, Texas. J.A.M.A. *155*:632-635, June 12, 1954.

Although heart disease ranks first in America as a cause of death, many with cardiac complaints have no evident physical basis for their symptoms. The symptoms described as "Da Costa's syndrome," irritable heart, effort syndrome, and neurocirculatory asthenia are held to be anxiety states in which the patient's attention is focused on his heart.

Since no regularly occurring organic cardiac changes have been demonstrated, the anxiety is considered causative; and the term "anxiety heart disease" is felt to be most descriptive of this state. It has been shown in a 20 year follow-up of 173 patients with this disorder that anxiety does not increase the incidence of organic disease and that reassurance and the passage of time were as curative as other more drastic treatment measures.

It is suggested, in the case of patients with normal hearts but with undue concern about their cardiac status, that no stress be placed on their symptoms, that no medication be given for their hearts, and that no restrictions be imposed. Treatment depends on elucidating the patient's interpersonal conflicts and allowing him to express his hostility or fears. 11 references.—*Author's abstract.*

146. *Intellectual and Affective Changes in Essential Hypertension.* RALPH M. REITAN, Indianapolis, Ind. Am. J. Psychiat. *110*:817–824, May 1954.

In 1951, Apter, Halstead, and Heimburger presented evidence describing objective measurement of organic impairment of adaptive capacities (intelligence) that may occur early in the course of essential hypertension and in the absence of neurologic signs. Their method

of study combined neurologic, experimental psychologic, and psychiatric technics. The writer had obtained Rorschach test protocols on these same patients, and the present study was concerned with possible confirmation of the earlier reports with the results obtained from this test alone.

Thirteen patients with essential hypertension and minimal if any neurologic signs were individually matched on the basis of color, sex, age, education, and I.Q. with patients having proved organic brain damage, as well as with patients having neurotic difficulties but no neurologic or anamnestic evidence of brain damage or disease. Statistical intergroup comparisons indicated that the mean scores on quantitatively scored Rorschach variables for the hypertensive group consistently fell between those of the other two groups. The neurotic group regularly had the highest and the brain-damaged group the lowest mean scores. Many of these mean differences were not significant statistically, but the regularity of relative positions of the three groups indicated that the hypertensive group was similar to the neurotic group, whereas the brain-damaged patients gave the Rorschach test signs of brain damage more frequently. Qualitative interpretation of the protocols suggested mild brain damage in about half the hypertensive group. Each group gave substantial indications of neurotic difficulties. Because of the small size of the groups and some question as to the validity of certain of the Rorschach variables no attempt was made to suggest a specific syndrome of psychologic changes in essential hypertension. 26 references. 2 figures. 5 tables. —*Author's abstract.*

PSYCHIATRIC NURSING, SOCIAL WORK, AND MENTAL FATIGUE

147. *The Clinical Psychologist as a Humane Scientist.* R. M. MOWBRAY, Manchester, England. Brit. J. Med. 27:164–169, June 1954.

The article discusses some problems of the role, both academic and professional, which faces the British clinical psychologist, who at present has no formalized training or background. The basic problem is viewed as the clinical psychologist's need to maintain two attitudes—the scientific and the clinical. In the extreme these attitudes can conflict, but because of his assumed role of humane scientist the clinical psychologist is rarely, if ever, aware of such conflict. This "humane scientist" role is in part defensive and in part compromise.

The concept of objectivity has clinical as well as scientific relevance. Objectifying relationships with the psychologically ill is a means of dealing with possible overinvolvement in the emotional difficulties of the patient. This "protective objectivity" is a defense against the maximal demands made upon the sympathy and empathy of the psychologist dealing with neurotic and psychotic patients. Thus factors other than scientific integrity operate in the clinical psychologist's acceptance and maintenance of the concept of objectivity.

The humane scientist is a compromise role in that the present position is one where too great demands are being made upon too little knowledge in clinical psychology and psychiatry. This position puts research at a premium, and long term understanding has to compete with the solution of existing *ad hoc* problems for the clinical psychologist's professional time.

The scientific immaturity of clinical psychology is a result of the clinical psychologist's reluctance to go beyond rank-order measurement in his work. Psychologic properties are amenable to treatment by ordinals, and the clinician, by and large, accepts the transition from qualitative or relativist concepts to ordered numbers. Beyond rank-order measurement an equal unit scale is required, and the clinical psychologist, of all psychologists, is least in a position to conceive of such equal unit scales covering the properties he considers relevant.

Two future trends in research are suggested: 1. the application of individual differences in nosology and 2. the development of situational observation under controlled conditions whereby the aspects of experience and behavior that produce suffering can be studied in operation. If such trends develop, a new attitude toward statistics will be necessary, in which the difference between psychologic and statistical significance will be stressed. 8 references. —*Author's abstract.*

For Reference Only

148. *Collectivism, a Social Phenomenon of Our Time, and Mental Health (La Collectivisation, phénomène social de notre époque, et la santé mentale).* C. CONSTANTINIDES, Athens, Greece. L'Hygiéne ment. *1*:21–30, 1954.

PSYCHOLOGIC METHODS

149. *Diagnosis of Brain Diseases by Psychologic Methods (Diagnostic des maladies cérébrales par les méthodes psychologiques).* ARTHUR L. BENTON, State University, Iowa. L'Encéphale *43*:54–72, 1954.

The author reports on the behavior problems of a child at the beginning of a progressive cerebral illness. The behavior of the child, which was connected with the tensions of his life, had been interpreted as psychogenic. However, psychologic tests clearly revealed an intellectual feebleness of the organic type already present at the beginning of the illness, at a time when the specific physical and neurologic symptoms were still absent.

On the basis of the results of this case, the role of psychologic tests in neurology is discussed. These methods have their serious limitations, but despite their rather primitive nature they may be of great value. 10 references. 3 figures.

For Reference Only

150. *The Life and Work of Hermann Rorschach.* HENRI ELLENBERGER. Bull. Menninger Clin. *18*:173–219, September 1954.

For Reference Only

151. *Research in Clinical Psychology: 1953.* WILLIAM SCHOFIELD, Minneapolis, Minn. J. Clin. Psychopath. *10*:203–212, July 1954. 36 references. 1 figure.

TREATMENT

a. general psychiatric therapy

152. *The Psychiatric Sheltered Workshop in the Rehabilitation of the Mentally Ill.* JACK MEISLIN, Montrose, N. Y. Arch. Phys. Med. & Rehab. *35*:224–227, April 1954.

Interest in the rehabilitation of the physically handicapped is now at its peak. The mentally ill are not so fortunate. No prosthetic device has yet been discovered to substitute for the function of the human mind. Industry has been refusing to open its doors to the post-psychotic individual. There does not exist, in this country, a vocational bridge to allow the convalescing mental patient to make a gradual transition from the protective hospital environment to a competitive life in the community. This article deals with the urgent need of psychiatric sheltered workshops and includes a suggested plan for their organization.

The author points out the large number of patients who are yearly readmitted to the psychiatric hospitals. He indicates that a good many of these return because of inadequate vocational "preparedness." Some patients avoid the responsibility of obtaining employment; others are unable to keep up with the usual job demands. Lack of psychiatric sheltered workshops is also instrumental in discouraging hospitalized patients from seeking discharge into the community If we had adequate sheltered vocational facilities they would assist many psychiatric patients to *avoid* hospitalization in mental hospitals. With the advance of modern technics, particularly psychosurgery, the doors of mental hospitals have opened even to long term, chronic, "hopeless" psychiatric patients. The majority of these are at present noncontributing members of society because they cannot be normally employed. Sheltered workshops would give many of these patients the opportunity of being self supporting as well as the emotional satisfaction and pride of being a wage earner. Another important consideration is that the organization of such workshops would aid considerably in the present campaign of "educating the employer" to the fact that these patients can be productive and are able to contribute to the nation's economy.

As a member of the Committee on Medical Rehabilitation of the American Psychiatric Association and as Chairman of the Committee on Correlation of Physical Medicine and Psychiatry of the American Congress of Physical Medicine and Rehabilitation, the author is in a particularly favorable position to evaluate this problem of psychiatric sheltered workshops from the point of view of both physiatrists and psychiatrists. He feels that the establishment of these workshops, to provide adequate vocational counseling and on the job training facilities, is a project of a "triple partnership: psychiatry, physical medicine and rehabilitation, and industry." 8 references.—*Author's abstract.*

b. drug therapies

153. *Chlorpromazine in the Treatment of Neuropsychiatric Disorders.* N. WILLIAM WINKELMAN, JR., Philadelphia, Pa. J. A. M. A. *155*:18–21, May 1, 1954.

Results of this study indicate that chlorpromazine, 10-(3-dimethylaminopropyl)-2-chlorphenothiazine, has a definite place in the treatment of neuropsychiatric patients, both by the general practitioner and by the psychiatrist. These data show that the drug is es-

pecially remarkable in that it can reduce severe anxiety, diminish phobias and obsessions, reverse or modify a paranoid psychosis, quiet manic or extremely agitated patients, and can change the hostile, agitated senile into a quiet, easily managed patient.

In all, 142 patients were treated. Those with severe anxiety and tension responded well to chlorpromazine therapy. Within one week, most began to sleep better and to feel more refreshed on awakening. Physical complaints decreased as anxiety and tension decreased; musculoskeletal symptoms that had persisted for years gradually diminished, as did gastrointestinal symptoms. The beneficial effects following the use of chlorpromazine in patients with severe obsessional and phobic symptoms suggest that the drug be tried in such patients before resorting to frontal lobotomy. For managing agitated, anxious, belligerent, obstreperous senile patients, chlorpromazine proved effective when the usual sedatives had failed. Moreover, it appeared to calm patients without appreciably depressing their mental processes, as the barbiturates do. Moderately and markedly agitated psychotic patients were also adequately controlled when given chlorpromazine. The drug should not be considered merely a chemical restraint that has no effect on the patient's illness; on the other hand, it cannot be considered a panacea for all psychiatric ills.

Two of 6 epileptics whose seizures were inadequately controlled with phenobarbital and Dilantin were kept free of seizures when chlorpromazine was added to their regimen. These effects seem to demonstrate the potentiating effects of chlorpromazine on other drugs, especially CNS depressants, which the French and other European investigators have reported. However, no significant potentiating effects and improvement were observed when 6 patients with paralysis agitans were given chlorpromazine with Artane or Rabellon.

Patient response to chlorpromazine varies considerably. In general, most patients could be comfortably maintained on doses of 25 mg. orally three times a day. Dosage should be increased or decreased in accordance with the patient's individual tolerance. Severely agitated patients, such as manics, required doses of 50 mg. intramuscularly two or three times a day. Some degree of drowsiness occurred in almost all patients during the first few days of therapy; however, the drowsiness diminished or disappeared as therapy was continued. In most cases it could be controlled by giving Dexedrine or caffeine concurrently. Side effects of dry mouth, hypotension, increased frequency of dreaming, and constipation also occurred, but to a much lesser extent. In addition, 3 patients developed jaundice, which subsided when the drug was withdrawn, and 2 developed urticarial dermatitis, which also subsided.

In conclusion, chlorpromazine, though no substitute for analytically orientated psychotherapy, is an important advance in the therapeutic management of psychiatric patients. 9 references. 1 table.—*Author's absrtact.*

154. *The Problem of Activated Psychosis in the Insulin Therapy of Schizophrenics* (*Das Problem der aktivierten Psychose in der Insulinbehandlung Schizophrener*). ELISABETH HERZOG, Munsingen. Schweiz. Arch. f. Neurol. u. Psychiat. *72*:49–76, 1953.

In the course of insulin treatment of institutionalized schizophrenics the author has tried to define the "activated psychosis" and found that there are different psychopathic symptoms involved, which vary regarding their genesis and frequency.

Aside from the very rare genuine activation of the schizophrenic psychoses through hypoglycemia as well as the recurrence of schizophrenic symptoms as a reversal of otherwise already vanished symptoms it was impossible to establish purely exogenous pathographies or a pseudoactivation through mere release. It was found, furthermore, that the so-called reactive reversal may be regarded mostly as an alarm signal of a threatening relapse.

The author attributes special importance to the subjective wrangling with experiences of death and the struggle for the rebuilding of personality and world during the awakening from the hypoglycemic coma after an intrastomachic interruption. In her opinion, these occurrences seem to indicate most clearly the relation to the therapeutic efficiency of the treatment and the necessity to accompany the somatic treatment with psychotherapy. 29 references.

155. *Observations on Organic Brain Damage and Clinical Improvement Following Protracted Insulin Coma.* EUGENE REVITCH, Lyons, N. J. Psychiat. Quart. *28*:72–92, January 1954.

Instances of organic brain damage and clinical improvement after protracted coma during insulin shock therapy of schizophrenia have been amply mentioned in literature. However, the relationship of clinical improvement to the postcoma brain damage has not been correlated. Protracted coma is a rather rare complication, and since not enough cases are seen by the same observer, statistical studies are practically impossible. The author had the opportunity to study 8 cases of protracted coma during insulin shock therapy of chronic schizophrenics. Out of the 8 patients, 5 showed clinical improvement. In 4 of the 5 patients there were symptoms of organic brain damage lasting from three to four weeks. The brain damage was elicited through clinical, psychologic, and electroencephalographic studies. Clinically the affected patients presented a picture of disorientation in time and place; loss of memory; perseveration; somnolence; regression; agnostic, apractic, and aphasic phenomena; and, later on, vacant euphoria. As the clinical symptoms of organicity became less and less prominent, the patients scored higher on the Wechsler-Bellevue test and fewer Piotrowski signs were recorded on the Rorschach test. The slow activity on electroencephalograms recorded shortly after emergence from coma was gradually replaced by normal picture as the patient improved clinically. During the emergence from organicity, delusions and hallucinations gradually returned, but the affect changed from hostility to friendliness and affability, and tension experienced before the protracted coma was replaced by feelings of relaxation. Owing to these affective changes, patients' behavior and ability to lead an extramural existence improved to such an extent that one patient kept on closed wards for 10 years was able to help in his father's business in spite of persistence of delusions. In the 3 unimproved patients, organic symptomatology was extremely mild and short lived, but even there, there was some improvement of affect lasting just a few days. Thus one of the unimproved patients was friendlier to his mother and interested in his family for two days after arousal from coma, but then he relapsed into his previous state of cold hostility and disinterest in anything but his delusional system. The improved patients were followed for a period of 3 to 14 months, and all of them maintained their improvement for that period of time. The patient followed for 14 months started showing signs of relapse, however,

since he became more preoccupied with FBI agents and VA personnel than after termination of treatment, and the relaxation he experienced previously was on the wane. However, he was still able to work. The author proposes a hypothesis that clinical improvement recorded after protracted insulin coma therapy consists not in changes of patients' content of thought but in the changed affect. This is due to disruption of associative pathways not unlike that in lobotomy. 19 references. 5 figures. 1 table.—*Author's abstract.*

156. *Subconvulsive Intravenous Metrazol Therapy in Mental Patients.* A. L. LIEBERMAN, Northport, N. Y. Geriatrics. *9*:125–127, March 1954.

Metrazol was given to a group of some 75 private patients. The 10 per cent solution was administered intravenously in subconvulsive doses. One cubic centimeter was given with the patient lying quietly in bed. The dose was increased daily in increments of 0.5 cc. until a level of 2.0 cc. was reached. If no reaction occurred the dose was increased 0.2 cc. each time until it produced a mild but recognizable reaction. Subsequent doses were kept just below this level. Twenty-five to 50 such intravenous subconvulsive doses were given, with injections spaced at about three a week.

Most of the patients were geriatric problems carrying a diagnosis of cerebral arteriosclerosis with psychotic changes. The results in this series were distinctly encouraging. Not only were the older patients improved but also some with severe organic brain changes and a few much younger individuals who had psychoses without recognizable somatic pathology. Several representative case reports are presented. 14 references.—*Author's abstract.*

157. *Isoniazid Treatment of Psychiatric Patients.* FREDERICK LEMERE, Seattle, Wash. Arch. Neurol. & Psychiat. *71*:624–625, May 1954.

Sixty-five psychiatric patients with various types of reactions, including depression, schizophrenia, anxiety, neurasthenia, migraine, and organic psychoses, were treated with isoniazid. Of these 65 patients, only 8 reported any improvement that seemed to be definitely related to the drug or its suggestive effect.

The effect of isoniazid on the personality is varied and unpredictable. In general, it appears to be that of a stimulant in smaller doses and a neurotoxin in larger doses.

Isoniazid is of very limited, if any, value in the treatment of psychiatric patients. It seems occasionally to help overcome fatigue, mental sluggishness, or depression associated with any of the various reaction types. 4 references. 1 table.—*Author's abstract.*

c. psychotherapy

158. *Twenty Years of Group Psychotherapy; Purposes, Methods and Mechanisms.* RUDOLF DREIKURS, RAYMOND CORSINI, Chicago, Ill. Am. J. Psychiat. *110*:567–575, February 1954.

The group method, called group psychotherapy, has developed rapidly in the last 20 years; it presents a minor revolution in psychiatry and may have profound implications for our whole society. An integration of the numerous reports into one body of knowledge is still missing. Different therapists make similar observations and get similar results but

come to divergent interpretations. The group medium, which permits a replication of therapeutic phenomena, may permit greater scientific clarification of the dynamics involved.

About 500 papers were surveyed, in order to extract dominant ideas. In a historical review, the development is outlined from the time of Mesmer. Group psychotherapy is fundamentally a product of the twentieth century. It was called "collective counseling" in Europe and named "group psychotherapy" in 1930. Pioneers in this new method are mentioned. Group psychotherapy disappeared in Europe with the advent of totalitarianism and took hold in the United States. It is essentially a democratic procedure, and its use reflects the political climate of a nation.

The rapid development in the United States began about 20 years ago. Since 1936 the output of papers has increased in geometric progression, from 11 papers in the first 20 years of this century to 20 in the next decade and some 90 in the thirties. Between 1940 and 1949 over 500 papers were published.

Two aims of group psychotherapy may be distinguished: its clinical value, the immediate purpose for which group methods are used; and its theoretic or philosophic implications, the far reaching significance of group dynamics. Group methods have been reported with all emotional and mental disorders. They have been used in mental hospitals, prisons, outpatient clinics, in child guidance, military training, general hospitals, and private practice, in the management of physical disease, and the improvement of family relations.

The second purpose of group psychotherapy is the study of the dynamics operating in the group. Two points of view exist. Adherents of the various psychodynamic schools tried to apply recognized psychodynamics of the individual to the group situation. Others explored specific group dynamics, which are different from, although supplementary to, psychodynamics of the individual. The methods established in group psychotherapy reveal approaches to social problems in general. Group methods are used in education, social clubs, penal institutions, race relations, and industry. The existence of therapeutic groups may have some effect on the development of human relationships within the community.

The methods used in group psychotherapy vary greatly. Specific technics mentioned are: the use of drawings, textbook-mediated therapy, the blackboard procedure, the semantic approach, the leaderless method, the leaderless panel method, psychodrama, therapeutic drama clubs, social clubs, multiple psychotherapy, the use of puppets, play technics, activity group methods, analytic method, hypnotherapy and self-help methods. These various methods fall into patterns that permit classifications. Classifications mentioned by others are repressive-inspirational, didactic, analytic, authoritarian, laissez-faire methods, activity methods, the verbal versus the nonverbal approach, the directive versus the nondirective.

Eight dimensions are described by the authors: the role of the therapist, the use of verbal communication, the type of interactions that take place, the extent of formalism, the content of the sessions, the ratio of patients to therapists, the composition of the group, and the atmosphere of the group. The various reports are classified in accordance with these eight dimensions. They form a basis for an analysis of any method of group psychotherapy. A factor analysis may help to identify the basic dimensions existing in group psychotherapy.

It is still difficult to clarify the mechanisms that operate in a therapeutic group process. The Freudians, the Adlerians, and the Rogerians, the three dominant schools among group

therapists applying individual dynamics to the group, take their concepts of the mechanisms from their orientation. Moreno established a theory of group dynamics, followed by Lewin and Lippitt. Over-all theoretic formulations of the mechanisms involved in terms of specific therapeutic agents are missing. The authors mention the correlation of effectiveness with participation, the effect of public disclosure, of universalization, the educational process facilitated by the interaction of group members, the mutual help and mutual responsibility, the social reality testing, the change in human relationships toward social equality, the group as a value-forming agent.

Group psychotherapy may be able to accomplish what psychiatry has been unable to do so far, to integrate the various dynamic theories into one body of scientific knowledge. 92 references.—*Author's abstract.*

159. *Theory of the "Total Push" Program in Psychiatry.* ARPAD PAUNCZ, Downey, Ill. Am. J. Psychotherapy. *7*:11–20, January 1954.

The term "total push" was introduced into psychiatric literature in 1939 by A. Myerson, late professor of neurology at Tufts College Medical School, Boston. The correct meaning of the concept is not push at all. It is rather a dramatic protest against the therapeutic inertia and resignation in mental hospitals and a stirring battle cry for the mobilization of all creative energies in the patients, in the doctors and personnel, and in the whole hospital for the patient's welfare. The forerunners of the concept were Benjamin Rush, America's first psychiatrist; Philippe Pinel, the French "liberator of the insane;" and Herman Simon of Germany.

The theory is based upon the following fundamental concepts:

(1) The hospital is for the patient. Not standardization and mechanization are the most important things but the comfort, welfare, and if possible the cure of the patients. Hospital management should not be a rigid and deadly routine consisting of inflexible rules and regulations but a living elasticity molding itself to the changing needs of the patients.

(2) Psychologic factors in the patients as persons. Mechanical and somatic approaches are not enough. While love, kindness, and reasonableness create the therapeutic atmosphere, the depth-psychologic knowledge of the patient's personality characteristics is really the tool for a promising therapeutic end. Patient should be understood not only from the point of view of pathology but also by emphasizing the degree of his still existing "normalness" in spite of pathology.

(a) "Still normal" aspects of the patient. Simple medical ethics require that we do not give up the patient as long as he breathes or his heart is beating. In spite of disorganization and deterioration, he is not a "lost soul," but still a human being with some assets to reckon with. He still has his likes and dislikes, his desires and expectations.

(b) To exist is to persist. With the "still healthy" aspect of his personality the patient, as all living creatures, retains his strivings for survival and the perpetuation of his existence in accordance with nature's fundamental law, that the purpose of life is living.

(c) Duties and responsibilities in spite of sickness. With the assets of the patient goes a limited degree of freedom of choice between his sickness and health, and a certain amount of responsibility for his present and future welfare. There is full justification to assign to

patients in a hospital meaningful and properly motivated activities. We should make them realize that they are not merely guests of the hospital but also its substantial participants in its maintenance and function.

(d) In spite of regression, patients retain the characteristics of their adulthood, the realization of which necessarily modifies our understanding and the method of therapy. Even if his regression takes him back into his past, he still keeps his interest in the present.

(e) Dignity retained in spite of sickness. Psychiatric pathology not only deteriorates but brings out hidden qualities, especially dignity, of the patient. Sickness may broaden and deepen the patients' philosophy of life and makes them often mellower and more charitable. Very often such patients become more preoccupied with the universe than with their personal miseries, more with the mysteries of existence than with their everyday problems.

(3) Psychologic factors in the personnel functioning as therapists.

(a) Recognition of the patient's inherent worth. Without the awareness of such concept no meaningful therapy can ever be accomplished. The personnel should be instructed in the simplest medical ethics, which put the patient's welfare above all other considerations.

(b) Faith in the patient's inherent capacity for reconstruction. Devoted and efficient personnel never give up the patient no matter how hopelessly incurable. We witness many times patients with somatic or psychic malignancy living 10 to 20 years longer than our scientifically justified prognosis predicted. We must be modest enough to understand that even the most scientific knowledge carries with it a certain degree of ignorance, and broad-minded enough to realize that even ignorance may have its share of wisdom.

(c) Personnel's inherent capacity to help. Not only the patient's slumbering vital potentialities must be stimulated and utilized but also our own deeply hidden resources and attitudes. We perhaps never use more than 10 per cent of our latent mental ability; therefore, let us make it our program to invest more of this "mental capital" in our profession and the business of everyday living. Through mobilization of our interest in a special task we can be inspired to inexhaustible efforts.

(d) Incentive for and satisfaction from job accomplishment. The changed attitude of the personnel goes hand in hand with essential change in the patient's condition, which is a new stimulation for additional attainment. By transforming the employees' impersonal occupation into a self-gratifying profession their work obtains new meaning and new rewards.

(e) Accomplishment of the seemingly impossible. If we substitute for the therapeutic philosophy of despair a constructive affirmation of therapeutic hopefulness, we need not give up any case. The question is whether we anticipate defeat or accept the challenge, whether we should worry because certain conditions of the patients cannot be resolved, or rather be dedicated to the resolution that those certain conditions may be resolved and will be resolved.

(f) Characteristics of personnel functioning as therapists. Is it true that mental hospital employees are personally insecure, professionally inadequate, masochists or sadists? Or do we have to acknowledge good faith in their choice of profession and have to value their preference for the "underdog?" We also have to be aware of their devotion to duty and must pay tribute to them for their sense of dedication as a manifestation of genuine creative effort rather than as an indication of any overcompensatory or sublimating mechanisms.

We must salute them for all these characteristics which in the noblest sense of the word makes them truly "their brothers' keepers."—*Author's abstract.*

160. *Gruppenpsychotherapie in der Anstalt (Group Psychotherapy in the Institution).* EBERHARD KLUGE AND HELLFRIED VON SCHROETTER, Oetwil am See, Switzerland. Monatschr. f. Psychiat. u. Neurol. *127*:152–170, February-March 1954.

The authors are less concerned with theory than with the practical psychotherapeutic treatment of the psychotic, trying to find the method that requires the least expenditure—that avoids secondary damages, makes the patients feel comfortable in the institution, and conditions them for readjustment after release.

Emphasis is placed on psychotherapeutic work in groups. The patients are divided in two categories: 1. Discussion groups; 2. Singing, playing, and reading groups (which include the senile cases).

This work is carried on by psychotherapeutic teams, which consist of the physicians and experienced nursing personnel, who lay their plans in free discussions.

The authors are of the opinion that this group treatment within the hospital routine helps the greatest possible number of patients and that the personal attention of the above teams is the best way of modifying the hospital atmosphere and reaching the patients as individuals. 26 references.

d. the "shock" therapies

161. *Electric Shock Treatment and the Menstrual Cycle.* S. T. MICHAEL, Hartford, Conn. Arch. Neurol. & Psychiat. *71*:198–207, February 1954.

The records of 687 female inpatients of the New York State Psychiatric Institute treated by electric shock treatments were reviewed to elucidate the menstrual disturbances that occur during shock treatments. The menstrual disturbances caused by shock treatment were diverse, the most frequent pattern being amenorrhea, and the next most frequent a shortening of the menstrual cycle in which the shock treatment was introduced. By statistical elaboration it was possible to demonstrate that the basic effect of shock treatment is amenorrhea.

By considering only the immediate impact of shock treatment on the menstrual cycle during which shock treatment was introduced, it was possible to hypothecate that patients who require 9 treatments or less have a different type of menstrual physiology than patients requiring 10 to 20 treatments.

The degree of amenorrhea was statistically correlated to the number of electric shock treatments, but the correlation was of low order ($r = 0.34$). The correlation was considerably enhanced in patients who were treated simultaneously with insulin shock and electric shock treatment ($r = 0.58$).

The summation of the effect of individual treatments, which in clinical practice leads to application of treatment in series of convulsions, may also be observed on the effect on menstruation. Resumption of menstruation after completion of a series of shock treatments is delayed in direct proportion to the number of shock treatments in the individual series.

The low or moderate order of correlation leaves open the possibility that other factors inherent in the treatment situation may be instrumental in moderating the menstrual disturbances. One of these, the natural periodicity of the menstrual cycle, is probably responsible for an increased frequency of resumption of menstruation between 24 and 30 days after the last shock treatment of a series of treatments.

Combination of electric shock treatments with sub coma or coma insulin enhanced the amenorrhea and also led to closer correlation between the length of menstrual cycle and the number of electric shock treatments.

The data were interpreted as indicating decrease of pituitary gonadotropic function. 11 references. 5 figures.—*Author's abstract.*

162. *Unipolar Electrocerebral Stimulation; A New Method in the Treatment of Psychiatric Disorders.* JOSEPH EPSTEIN, New York, N. Y. Dis. Nerv. System. *15*:146–152 May 1954.

This article describes a new method of electrocerebral treatment. It consists of the introduction of a spiked pulse type of unidirectional current (Reiter CW47C apparatus) through a *unipolar* electrode into selected regions of the head. The unipolar method utilizes an indifferent bracelet-shaped electrode applied to the right forearm, and an active electrode about the size and shape of a dime, which is applied with a handle to selected areas of the head. All evidence points to the fact that the current penetrates the cortex with a minimum of spread, stimulates the diencephalon and the reticular activating substance of the brain stem, and reaches down to the medulla. Findings demonstrate profound effects upon the autonomic nervous system. All this occurs without a concomitant convulsive seizure. Previous methods involve bipolar application of electrodes to the head. The diffuseness of the current spread with the latter method brings about violent and generalized cerebral reaction with convulsions, memory changes, and physical dangers.

The unipolar method of stimulation eliminates these complications. It extends the possibility of treatment to patients hitherto presenting findings to contraindicate conventional electroshock. Unipolar stimulation is under constant control of the operator. Adjusting the current to minimal levels avoids cardiac or respiratory embarrassment. Muscular movements and spasticity can be controlled and reduced, so that no fractures can ensue. Curare and curare-like drugs are entirely unnecessary. Preliminary studies with a group of 22 patients indicate results similar to those obtained with convulsive shock treatment. On the basis of this limited series of cases no definite conclusions can be formed. The problem of whether a convulsion is a sine qua non of treatment is discussed. The technic described lends itself to new research possibilities. The stimulation of deep cerebral areas without concomitant convulsions will enable us to acquire new biochemical, endocrine, hematologic, and other data, and to compare such findings with those already available in connection with convulsions. 16 references—*Author's abstract.*

163. *Anxiety After Electroshock Therapy in Involutional Melancholia.* THOMAS FREEMAN AND JOHN L. CAMERON, Glasgow, Scotland. Brit. J. M. Psychol. *26*:245–261, 1953.

This paper records some observations made in a small series of patients suffering from

involutional melancholia who had failed to respond to electroshock therapy. The outstanding feature of these cases, both objectively and subjectively, was an intense degree of anxiety from which they had not previously suffered. This anxiety expressed itself in a threat not only to their inner feelings but also to the external world.

A review of the psychoanalytic theories of melancholia is given and a theory proposed to account for the presence of the extreme anxiety after electroshock. Some recommendations are made with regard to electroshock therapy.

The second part of the paper comprises a provisional report on the treatment of these patients by group psychotherapy using psychoanalytic insights. The report covers the first six months of the treatment. Favorable therapeutic signs were shown by 2 or 3 of the patients. 12 references.—*Author's abstract.*

164. *Value of Electric-Shock Treatment on Outpatients.* ROBERT R. MEZER AND HARRY C. SOLOMON, Boston, Mass. New England J. Med. *250*:721–722, April 1954.

Of 92 patients who were started on outpatient electroshock treatment at the Southard Clinic of the Boston Psychopathic Hospital over a two year period, 10 per cent broke treatment. Of 84 patients who completed treatments, 87 per cent improved; 90 per cent of 61 affectives; 60 per cent of 10 paranoids; 92 per cent of 14 mixed.

Four of 11 patients who failed to improve with outpatient treatment did improve with additional treatments with electric or insulin shock while hospitalized.

Of the total number of patients treated, 7 per cent developed complications.

Various drugs were used to soften the convulsion in patients with physical disabilities. Maintenance shock treatments were of value in patients who relapsed shortly after a course of intensive treatment.

Outpatient shock treatment appears worth while both therapeutically and financially. It is less disturbing to the patient and the family. It should be seriously considered before patients are admitted to mental hospitals. 2 references.—*Author's abstract.*

neurology

CLINICAL NEUROLOGY

165. *Disturbances of Sensation in Children with Hemiplegia.* J. P. M. TIZARD, London, England; RICHMOND S. PAINE AND BRONSON CROTHERS, Boston, Mass. J. A. M. A. *155*:628–632, June 12, 1954.

Disturbances of sensation are frequent among children with hemiplegias, whether congenital or acquired subsequently, and have been insufficiently understood, since they are difficult to test for in very young children.

Of a series of 106 patients with hemiplegias, forming part of a larger group in a follow-up study of cerebral palsies, approximately 50 per cent had defects of peripheral sensation, affecting most commonly stereognosis, two point discrimination, position sense, and passive motion sense. Pain, touch, and temperature sensations were less frequently affected. Approximately 25 per cent of one group had ipsilateral homonymous hemianopsias, but hemianopsia without accompanying peripheral sensory defect was rare. The sensory deficits were not closely correlated with the degree of motor or intellectual handicap or with the presence of convulsions, but there was frequent, although not universal, correlation with bony underdevelopment. Impaired peripheral sensation is of practical importance in further limiting a patient's ability to learn skilled functions with a hemiplegic hand, and in limiting the practical results obtainable from physical therapy or orthopedic surgery. Hemianopsia is of importance chiefly in connection with the driving of an automobile. 5 references. 2 figures.—*Author's abstract.*

166. *Arterial Occlusions Simulating Neurological Disorders of the Lower Limbs.* R. S. GILFILLAN, O. W. JONES, JR., S. I. ROLAND, AND E. J. WYLIE, San Francisco, Calif. J. A. M. A. *154*:1149–1152, April 3, 1954.

The syndrome of intermittent claudication has long been known; however, the failure of circulation to specific muscle groups and the appearance of claudication and sensory changes in relation to these during exercise are of only relatively recent recognition and are often confused with neurologic syndromes. The point of vascular occlusion determines the type of pain. Obstruction of the terminal aorta is characterized by global atrophy in the lower extremity, impotence, intense fatigue and muscular weakness on standing, and, at times, claudication in the buttocks, thighs, and legs. Total iliac obstruction is similar; however, the pain commences in the low buttocks and extends to the thigh and then to the calf on the affected side. It is similar to pain secondary to nerve root irritation. Partial iliac artery occlusion constitutes a syndrome of a systolic bruit over the involved artery, with claudication and pain commencing in the calf and proceeding to the thigh and buttocks secondarily. In obstruction of the femoral profunda artery there is usually pain in the anterior and medial aspect of the affected thigh on exercise. Obstruction of the superficial femoral artery is the cause of the well known type of claudication pain that occurs primarily in the calf and popliteal areas.

Among the most salient features of arterial occlusive disease is the onset of pain and its rapid increase in close proportion to the amount of muscular exercise. Another distinguishing feature is the rapid regression of pain after the cessation of muscular effort. The other signs of vascular disease that may enable one to separate them from musculoskeletal or neurologic disorders are the elevation pallor, dependent rubor, and absence of peripheral pulsation. Pain and paresthesia due to pressure on nerve roots follow a precise dermatomal distribution, while pain in an ischemic muscle group follows a sclerotomal pattern. Aggravation of pain by the Valsalva maneuver, change in tendon reflexes, painful or limited straight leg raising, and an abnormal myelogram indicate a neurologic cause. The differential diagnosis of low back, thigh, or gluteal pain should include consideration of arterial occlusion with herniated intervertebral disks, sacroiliac disease, or other abnormality of the low back and hip. 9 references. 3 figures.—*Author's abstract.*

ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM

167. *On Myelin and the Classification of the Nerve Fibers (Ueber das Myelin und die Einteilung der Nervenfaser).* VICTOR PATZELT, Vienna, Austria. Acta Neurovegetativa. *45*: 170–180. 1953.

This article discusses the diverse theories concerning myelin, myelin figures, and their origin.

Myelin is usually defined as a complex mixture of lipoids, which form the medullary sheaths of the nerve fibers. These sheaths serve as insulators, or according to some physiologists, as sources of energy. The author includes under the term *myelin* only those substances having the specific characteristics of the medullary substance. Myelin is an organized substance, strongly light refracting. In addition, it has the peculiar characteristic of forming myelin figures, which are dependent on swelling (caused by immersion in water, weak alkalis and acids, and other substances). Opinions vary whether these figures have their origin only in the medullary sheaths or whether they may be derived from neurons, or even from unmedullated nerve fibers.

In a detailed discussion of these diverse opinions, the chemical reactions and staining technics employed in the study of myelin, the author states that nerve fibers of small caliber contain as a rule few lipoids, and these do not represent myelin. Certain nerve fibers, especially in invertebrates, seem to occupy a transitional position between the two different types of nerve fibers, which are classified as medullated and nonmedullated fibers. 31 references. 1 figure.

For Reference Only

168. *A Note on the Early History of Cerebral Localization.* BYRON STOOKEY, New York, N. Y. Bull. N. Y. Acad. Med. *30*:559–578, July 1954. 22 references. 4 figures.

For Reference Only

169. *Autonomic Functions of the Diencephalon, A Summary of the Experimental Work of Prof. W. R. Hess.* P. GLOOR, Montreal, Canada. Arch. Neurol. & Psychiat. *71*:773–790, June 1954. 5 references. 4 figures.

For Reference Only

170. *The Pedunculus Cerebri and the Capsula Interna.* W. J. C. VERHAART AND K. MECHELSE, Leyden, Holland. Monatschr. f. Psychiat. u. Neurol. *127*:65–88, February-March 1954. 31 references. 6 figures. 1 table. 1 diagram.

DEGENERATIVE DISEASES OF THE NERVOUS SYSTEM

171. *Homonymous Hemianopsia in Multiple Sclerosis.* MAX CHAMLIN AND LEO M. DAVIDOFF, New York, N. Y. Neurology. *4*:429–437, June 1954.

Homonymous hemianopsia in multiple sclerosis is generally conceded to be rather rare. In several detailed studies of the disease there was conspicuous absence of homonymous hemianopsia. As a matter of fact, in a rather exhaustive perusal of the literature, the authors were able to find only two reports of three cases showing homonymous hemianopsia in multiple sclerosis.

The authors present 4 patients with homonymous hemianopsia occurring in multiple sclerosis. Thorough clinical studies were made to exclude other lesions that produce similar field defects. Furthermore, there was spontaneous regression of the field defects in 3 of the 4 patients.

It is possible homonymous hemianopsia is actually present more frequently than the clinician finds, because in those brains that were autopsied, the plaque of multiple sclerosis was often found to have invaded the suprageniculate visual pathways. However, it may be that at such stages the patient's condition does not permit the examination of visual fields, or t may be that previous attacks of retrobulbar neuritis had made the vision so defective that a homonymous hemianopsia would be difficult to discover.

In the 3 cases found in the literature as well as 3 of the 4 cases presented by the authors there were dense paracentral homonymous components. For this reason it has been postulated by the authors that when homonymous hemianopsia does occur in multiple sclerosis the lesion is apt to involve the visual pathways in the areas of the occipital cortex. 16 references. 4 figures.—*Author's abstract.*

For Reference Only

172. *The More Frequent Degenerative Diseases of the Central Nervous System Discussed with Special Regard to the Viewpoint of Social Medicine* (*Die häufigeren degenerativen Erkrankungen des Zentralnervensystems unter besonderer Berücksichtigung versorgungsärztlicher Gesichtspunkte*). GERD PETERS, Bonn, Germany. Fortschr. d. Neurol., Psychiat. *22*: 139–163, April 1954. 113 references.

For Reference Only

173. *Anatomo-Clinical Observations on Tuberous Sclerosis* (*Observations anatomo-cliniques sur la sclérose tubéreuse*). H. NOETZEL, Freiburg, Switzerland. J. brasil. de psiquiat. *3*:137, 1954. 19 references.

DISEASES AND INJURIES OF THE SPINAL CORD AND PERIPHERAL NERVES

For Reference Only

174. *The Diseases of the Peripheral Nerves (Die Erkrankungen der peripheren Nerven).* HANS HOHMANN, Würzburg, Germany. Fortschr. d. Neurol., Psychiat. *22*:45–124, February–March 1954. 8 references pages.

ELECTROENCEPHALOGRAPHY

175. *Electroencephalographic Changes Resulting from Carotid Artery Compression.* S. A. SKILLICORN AND ROBERT B. AIRD, San Francisco, Calif. Arch. Neurol. & Psychiat. *71*:367–376, March 1954.

The value of cerebral hypoxia, temporarily induced by carotid artery compression, was studied as a method of EEG activation in 60 unselected patients and 10 normal controls. Fifteen patients (25 per cent) showed marked EEG abnormalities, predominantly over the ipsilateral hemisphere, which were unrelated to carotid sinus sitmulation. The changes consisted tin he rather abrupt appearance of high voltage, slow waves, two to five per second in frequency, associated with marked irregularity of form and with bilateral asynchrony. The EEG changes were directly followed by such clinical manifestations as contralateral dysesthesias, jacksonian seizures in some patients, and loss of consciousness in about half of the "positive reactors." Of the positive reactors, 86 per cent were over 40 years of age, but only 36 per cent of the negative ones were in this age group. Eleven (73 per cent) of the "positive reactors" weer clinlcally diagnosed at "cerebrovascular disease" and five of seven (71 per cent) cerebral arteriograms performed in this group revealed lnternal carotid thrombosis. In patients with internal carotid thrombosis, the EEG changes invariably occurred during compression of the artery on the nonaffected side, the artery on the affected side being occluded by thrombosis. It was concluded that the evidence, though limited, suggested that carotid compression in certain cases causes EEG changes that might be of aid !n the diagnosis of cerebrovascular disease, especially carotid artery thrombosis, and in the evaluation of collateral cerebrovascular circulation, when the adequacy of the latter was suspected or was to be further impaired by carotid ligation. 53 references. 3 figures. 1 table.—*Author's abstract.*

176. *Metrazol Activation as a Diagnostic Adjunct in Electroencephalography; A Re-evaluation.* FLOY JACK MOORE, PETER KELLAWAY, AND NINA KAGAWA, Houston, Texas. Neurology. *4*:325–338, May 1954.

Metrazol activation studies have been made on 250 subjects. Of these, 120 were a highly selected group meeting strict criteria of normality—that is, asymptomatic individuals who had never had convulsions, fainting spells, central nervous system disease or any symptoms that might be construed as such, and who, in addition, had had a negative family history. (Only a very small number, 11, of this group had a psychiatric diagnosis.) Eighty-one patients were diagnostic problems, with equivocal epileptoid symptoms and/or abnormal

ectroencephalograms, and 49 were definite convulsive cases having nondiagnostic electrographic findings. Results for the latter two groups are comparable to those reported in the literatuer. Fifty-four per cent of normal controls under the age of 30 gave a positive (by presently accepted criteria) response land 62 per cent of these were spike and wave type. Of 61 normals over the age of 30, 16.4 per cent showed a positive response. Thus, age seems to be an extremely important factor in determining electrographic response to Metrazol. None of the normal group showed focal abnormalities with Metrazol. The slow technic was, however, very effective in activating focal abnormalities in the abnormal group. The effect of different technics on the results is discussed. Data are presented suggesting that regardless of the technic used paroxysmal spike and wave patterns can be produced with a low dosage of Metrazol in individuals with a negative history for convulsions, negative family history, and no related symptomatology. Within limits, *weight* did *not* seem to influence our results. It is well known that convulsions can be induced in anyone with appropriate stimulation. The assumption has been made that there is a group (epileptics) with an increased susceptibility, that is, with a low threshold of activation. Furthermore, the classic three per second spike and wave pattern has been almost universally accepted as a sign by which the epileptic may be differentiated from his "normal" brother. Yet, by the use of Metrazol, spike and wave can be elicited in a high percentage of normal controls as well as in epileptics, and with little correlation in regard to threshold. The spike and wave pattern is apparently elaborated by a mechanism which many of us, perhaps all, possess; why some have seizures and others do not appears to be due to something other than the simple ability to produce a certain type of electric discharge pattern. With regard to whether the test can be used in the diagnosis of epilepsy, our results suggest that it would be diagnostically valid when it gives a focal response, as no such responses were produced in our normal group. On the other hand, a generalized paroxysmal response, even when it is a spike and wave pattern, cannot reasonably be considered reliable evidence of a convulsive disorder! These findings are discussed in relation to the problem of the use of chemical activation as a diagnostic technic in clinical electroencephalography. 32 references. 3 figures. 3 tables.—*Author's abstract.*

177. *Metabolic and Electroencephalographic Changes in Idiopathic Epilepsy.* C. BRUCE HATFIELD, D. R. WILSON, AND HAROLD V. RICE, Edmonton, Alberta, Canada. Arch. Neurol. & Psychiat. *71*:208–216, February 1954.

Electrolyte and water balance studies were carried out on an epileptic patient, who was maintained on an accurately controlled regimen. An attempt was made to correlate these observations with changes in the electroencephalogram, eosinophil count, and urinary excretion of 17-ketosteroids and "cortin." The effects of pitressin, cortisone, and a diminished water intake were noted.

Cortisone and pitressin aggravated the patient's condition, presumably because of their ability to increase water retention. Restriction of water intake, however, resulted in reduction of the severity of seizures and an improvement in the electroencephalogram, although the frequency of the seizures was unaltered. Throughout the study there was an

unexplained retention of potassium, but other biochemical and hormonal studies were not significant.

It appears from this study that reduction of water intake is of importance in the control of idiopathic epilepsy.

HEAD INJURIES

178. *The Functional and Structural Bases for Psychic Phenomena Consequent to Cerebral Concussion.* CYRIL B. COURVILLE, Los Angeles, Calif. J. Nerv. & Ment. Dis. *118*:447–454, November 1953.

The purpose of this study is to align the psychic phenomena of the postconcussion state with the group of secondary, or symptomatic, neuroses. There are transitory pseudoneuroses accompanying diseased states, which should not be confused with those of psychogenic character. Fairly characteristic complexes typical of the various neuroses do occur with disturbance of metabolism, both acute and chronic infections, both exogenous and endogenous intoxications, deficiency states, and anoxemia. The resultant psychic symptoms, indistinguishable from those of psychogenic character, tend to clear up after the abnormal physical state has been corrected. The clinical manifestations of these secondary neuroses are the same as those of primary neuroses, but they are not dependent upon psychic factors to provoke them, and disappear without psychotherapy.

The fact that it is the specific mechanism with which force is applied that is significant in concussion indicates that the resultant symptoms, psychic or otherwise, are somehow the result of this mechanism. It is now believed that the major consequences of concussion are incident to the commotional effect on the brain within the bony globe of the skull. The shock that produces concussion also provokes a vasomotor instability which seems to be directly accountable for certain postconcussion symptoms—the headache, dizziness, and perhaps some of the nervous symptoms as well. Another source of support for the conclusion that the postconcussion state is a true clinical entity is found in its objective manifestations.

The view held by many psychiatrists of our own period is that postconcussion and posttraumatic neuroses are one and the same condition. Such is not the case, however, for in the first condition recovery follows medical therapy; in the second, recovery follows appropriate psychotherapy.

Symptoms of disturbances with respect to the intellectual or emotional equilibrium differ from the true postconcussion state in that in the latter the symptoms are not only entirely foreign to the patient's normal status but also completely unintelligible to him. These symptoms are slow to improve without specific treatment. But the significant aspect of the psychic aberrations is that recovery from these is often prompt and complete after definitive treatment with prostigmine bromide. This fact serves to distinguish them from the manifestations of a postconcussion neurosis.

There are visible and presumably reversible changes in the nerve cells of the cerebral cortex, which are contemporary with the psychic (as well as other) postconcussional symptoms. It is reasonable to believe that these visually evident, physical alterations do parallel

certain physicochemical changes in the cell, which can explain some, at least, of the clinical phenomena of concussion. 39 references.—*Author's abstract.*

INFECTIOUS AND TOXIC DISEASES OF THE NERVOUS SYSTEM

For Reference Only

179. *Bornholm Disease (Les Grippes du Diable—Maladie de Bornholm).* CLAUDE LEROY. Gazette M. de France. *61*:933, July 1954.

For Reference Only

180. *The Neurologic Sequelae of Tuberculous Meningitis in the Child (Les Séquelles neurologiques de la meningite tuberculeuse chez l'enfant).* H. DANON-BOILEAU. L'Encéphale. *43*:73, 1954.

For Reference Only

181. *The Diagnosis of Poliomyelitis.* MARTIN H. SLIFERT, Chicago, Ill. Postgrad. Med. *15*:512–518, June 1954.

NEUROPATHOLOGY

182. *Histopathological Changes in the Brain in Schizophrenia; A Critical Review.* MORTON R. WEINSTEIN, New York, N. Y. Arch. Neurol. & Psychiat. *71*:539–553, May 1954.

In this review the technologic and interpretive precautions that must be exercised in investigations concerning histopathologic changes in the brain in schizophrenia are discussed. The literature dealing with such changes in the neurons, glial elements, lipid components, and vascular and perivascular tissues is reviewed, and a special section is devoted to the work of Papez, and Papez and Bateman. The findings described are discussed in relation to the design of the investigative procedures used, the precautions necessary for interpreting such findings, and the implications that can be drawn from the contradictory and inconclusive results of 50 years of investigation on the histopathologic level. It is suggested that for those who reject the "functional" classification of schizophrenia, the very lack of definitive results from the histopathologic approach dictates a new attack on the problem of the etiology of schizophrenia at the level of metabolic dysfunctions in the brain. 39 references.—*Author's abstract.*

183. *The Pathology of the Blood Vessels in Multiple Sclerosis.* GIORGIO MACCHI, Parma, Italy. J. Neuropath. & Exper. Neurol. *13*:378–384, April 1954.

The author studied the vascular changes in 100 early, recent, and old plaques of demyelination examined histopathologically; 40 were situated in the spinal cord and 60 in the brain.

The vascular and perivascular lesions may be divided into 6 different types: 1. perivascular fat-granule cell accumulation; 2. perivascular exudative round cell infiltration (lymphocytes and plasma cells) and perivascular hemorrhages; 3. dilatation and congestion of the venules and capillaries: stasis; 4. proliferative vascular lesions: hypertrophy of the adventitia; proliferation of vessels; 5. degenerative vascular lesions: hyaline degeneration; 6. occlusive lesions of vessels: thrombosis.

Of 60 circumscribed plaques, 12 had a central vein, 12 multiple or eccentric veins, 36 total lack of veins.

The data presented indicate that the blood vessels undoubtedly play a role in the pathologic process; on the other hand, the author can not agree with those pathologists who assume that the histopathologic *primum movens* of the disease is an inflammation of the blood vessels, a periphlebitis, or venous thrombosis. The chronologic vascular changes in the process of demyelination could be summarized as follows: the first appearance of the demyelination is immediately marked by engorged venules and capillaries; this may be due to a vasoparalytic action brought about by substances that originate in the areas of demyelination. The drainage of fat and noxious substances, products of myelinonecrosis, causes vascular and perivascular reactions which may be summarized as follows:

1. Accumulation of fat and fat-laden macrophages in the perivascular places and in the adventitia, retarding the normal drainage through the perivascular places also in the surrounding area (perivascular dilatation of the small veins);

2. Proliferation of the adventitia and new formation of vessels;

3. Perivascular and pericapillary infiltration of round exudative cells, and sometimes perivascular hemorrhages.

Concerning the perivenous arrangement of some plaques of the white matter, a quite satisfactory explanation may be the fact that perivenous spaces are destined to drain the products formed in the demyelinating foci; it is possible that myelinolytic substances, arriving here, may constitute an essential factor for the new formation of plaques. 5 references. 5 figures. 1 table.—*Author's abstract.*

184. *Lesions of the Human Brain Following Circulatory Arrest.* KARL T. NEUBUERGER. J. Neuropathol. & Exper. Neurol. *13*:144–160, January 1954.

The histologic findings in the brains of 7 patients who died after circulatory arrest during operations are reported. The duration of the arrest varied between 1 and 10 minutes. The character of the lesions was that of parenchymal damage as observed after any form of cerebral ischemia. This included ischemic and severe cell disease, blanching, formation of ghost cells, wager-logged cell types, and pyknosis. Reaction in the supporting tissues with formation of rod cells and proliferation of astrocytes was first seen after a period of survival of 18 hours, but may have begun at an earlier time. Damage to the myelinated nerve fibers was histologically demonstrable after three days. Vascular reaction was first noted within two hours and consisted of stasis and escape of plasma. Endothelial cell swelling was observed after three days. More pronounced proliferative vasal response was seen in case 6 after one week, and indicated early stages of true softening, probably due to a degree of

circulatory disturbance more severe than in the other cases, where selective parenchymal necrosis prevailed.

The location of the lesions showed far more variety than expected. Case 1, a male, 38, with two hours of survival, showed generalized slight lesions but severe disease of the large striatal cells. Case 2, a female, 12, with 18 hours of survival, had accentuated cerebral cortical damage with less involvement of the gray matter elsewhere. Case 3, a female, 65, with 36 hours' survival, displayed rather universal cerebral and cerebellar damage with involvement of many cells in the reticular substance of the medulla. Case 4, a female, 23, with 3 days of survival, showed generalized damage with conspicuous lesions in the small striatal cells, and with disappearance of cells in the mammillary body. The lesion in the cornu Ammonis was mild, and that of the cerebellar cortex was severe but entirely focal. Case 5, a female, 19, with 7 days of survival, displayed most conspicuous lesions in both the thalamus and cerebellum; changes elsewhere were not too striking, and supporting tissue reactions were slight, considering the unusually long time of survival. Case 6, a female, 72, likewise with 7 days of survival, differed considerably. The variety of proliferative reactions that would be expected at this stage was fully manifest. The frontal and parietal cortex and the cornu Ammonis exhibited accentuated participation with pronounced microglial reaction; many Betz cells, often considered particularly resistant, had disappeared; the same was true of striatal and Purkinje cells. Of special interest was the involvement of the centers that are usually affected in Wernicke's disease, especially the mammillary bodies and posterior colliculi. Case 7, a female, 20, with 2 weeks of survival, the only case where a special study of a number of cortical areas had been feasible, displayed accentuation of the lesions in areas 4, 6, and 46. The Betz cells were spared. The cortical lesions were distinctly focal or spotty, with ill defined borders. The striatum and interbrain were badly damaged, but the cerebellum was well preserved. While there was some alteration of the reticular substance, the medulla and pons were spared, as appears to be the rule in all pertinent cases. The olives, as well as the dentate nucleus, were often involved. Pronounced pseudolaminar cortical degeneration was not prominent, but it can be stated that the third and fourth cortical layers showed accentuated vulnerability.

The pathogenesis of the lesions is discussed in some detail, and it is concluded that oxygen lack during the circulatory arrest, circulatory irregularities following it, and blood-brain barrier disturbances were the most important factors.—*Author's abstract.*

TREATMENT

185. *Studies in Myasthenia Gravis; Preliminary Report on Therapy with Mestinon Bromide.* KERMIT E. OSSERMAN, PAUL TENG, AND LAWRENCE I. KAPLAN, New York, N. Y. J. A. M. A. *153*:961–965, July 10, 1954.

Since 1934, with the discovery of the value of cholinergic drugs for myasthenia gravis, the treatment for this disease has been the use of analogs of physostigmine. The first of these, neostigmine, has long been the undisputed drug of choice.

Recently another cholinergic drug, Mestinon bromide (pyridostigmine bromide), which is a dimethyl carbamate of 3-hydroxy-1-methyl pyridinium bromide, an analog of neostigmine,

has been made available for clinical trial for the treatment of patients with myasthenia gravis.

Animal experiments reveal that Mestinon has about one sixth the acute toxicity of neostigmine. The anticurare activity on the sciatic-tibial preparation in the cat is one eighth that of neostigmine. The anticholinesterase activity on purified eel esterase is about one hundredth of neostigmine.

In a preliminary report from the Myasthenia Gravis Clinic of the Mount Sinai Hospital, New York, Osserman, Teng, and Kaplan report on the use of this drug on 20 patients.

A comparative study of neostigmine and Mestinon in equivalent doses (usually one 60 mg. Mestinon bromide tablet for each 15 mg. neostigmine bromide tablet) was made on these patients. The results obtained with Mestinon, as compared with neostigmine, were excellent in 9 patients, good in 3, fair in 3, equivalent to neostigmine in 4, with 1 failure. The duration of effectiveness of Mestinon is only slightly longer than neostigmine, although the nocturnal effect of Mestinon seems more prolonged than that of neostigmine, permitting patients to sleep through the night without the need of being awakened for another dose. Mestinon affects beneficially small skeletal muscles innervated by cranial nerves more than the limb muscles of patients with myasthenia gravis. A striking feature of Mestinon therapy is the lack of muscarinic and nicotinic side reactions. In the authors' experience Mestinon is a superior drug to neostigmine in the treatment of myasthenia gravis and appears to represent an advance in management. Neostigmine, however, has withstood the test of time, and further evidence is necessary before Mestinon can be suggested as the drug of choice for the treatment of myasthenia gravis. It is, however, highly recommended for further clinical trial.

An additional 35 patients were transferred to Mestinon by Osserman *et al.*, by the time of publication, with similar results as in the original 20 patients. Thus 55 patients have now been successfully transferred to Mestinon therapy. 19 references.—*Author's abstract.*

186. *The Surgical Treatment of the Cerebrovascular Accident.* SAMUEL ROSNER, Bronx, N. Y. J. Nerv. & Ment. Dis. *119*:245–250, March 1954.

This paper deals with surgical procedures, which the author has found to be of value in the treatment of hemorrhage into the brain, cerebrovascular thrombosis, or subarachnoid hemorrhage.

Mild cerebral hemorrhage due to hypertension or moderate cerebrovascular thrombosis should be treated by conservative methods. These are:

1. One spinal puncture should be performed, with measurement of intracranial pressure with a water manometer and removal of 10 cc. of fluid. The cerebrospinal fluid should be analyzed for protein, cells, Wasserman reaction, sugar, and chlorides.

2. If the patient has to be fed by vein, fluids should be restricted to 1,500 cc. in 24 hours. Thiamine chloride, 500 mg., should be added to one of the flasks, which should consist of 1,000 cc. of 5 per cent normal saline and 500 cc. of 5 per cent glucose in saline.

3. Insulin may be needed, for some patients will show hyperglycemia after a cerebrovascular accident.

4. Digitalis should be given in small amounts for cardiac support.

5. Atropine, 1/150 gr. twice a day, should be administered by hypodermic injection for control of pulmonary and cerebral edema.

6. Vitamin B complex and vitamin C should be injected daily in adequate doses.

7. The patient should be turned from side to side every hour while he is incapable of turning himself.

8. After one week, if there is no improvement in the paralysis, then Novocain and alcohol stellate ganglion block should be carried out on the side of the cerebral lesion. This can be done on the other side as well if there is no improvement after two weeks. In cases of more severe hemorrhage, stellate ganglion block should not be done before two weeks.

9. Physiotherapy can be instituted one week after a mild cerebrovascular accident and the patient can be allowed out of bed for short periods. He can be kept on a diet of pureed foods. Bowels are to be kept open by an occasional mild purge.

Subarachnoid hemorrhage is treated by repeated spinal puncture. Ten cc. of fluid are withdrawn slowly. The puncture is to be repeated every 12 hours until the fluid is mildly xanthochromic.

The author believes that cerebral angiography is dangerous in these cases. Unless the bleeding vessel can be ligated intracranially beyond the circle of Willis, there is no physiologic reason to do carotid ligations.

Massive cerebral hemorrhage or thrombosis of a major vessel should be treated by decompression and removal of the hemorrhagic or necrotic brain. The operation should be performed promptly before the onset of medullary edema.

Two cases are cited with similar histories, clinical picture, and pathologic findings. One patient is alive and well, and one died postoperatively. The author makes the plea for prompt surgical intervention in the severe cerebrovascular accident, since one cannot tell which patient will do well postoperatively.

Two important physiologic findings were:

1. Bilateral stellate ganglion block with alcohol resulted in relaxation of the constricted pupils to a semicontracted state. This usually happened within 48 hours. Following the bilateral block, the blood pressure fell gradually to within normal limits in the great majority of cases. This phenomenon persists.

2. Removal of intracerebral clot or necrotic tissue in many cases resulted in complete recovery of motor function in the paralyzed muscles. 5 references.—*Author's abstract.*

187. *Trigeminal Neuralgia; Pathology and Treatment.* G. F. ROWBOTHAM, Newcastle-upon-Tyne, England. Lancet. *16*:796–798, April 17, 1954.

In this paper 250 consecutive personal cases of trigeminal neuralgia are reviewed, and the various operative procedures carried out for relief of the pain are appraised.

The neuropathology of the disease remains unsolved; the hypotheses put forward by Harris, Dandy, Frazier, and Wyburn-Mason are discussed. The author's own suggestion is that the pain is due to perifilamentous adhesive neuritis, in contradistinction to an interstitial neuritis, as suggested by Harris. He substantiates his theory by describing histologic studies made of trigger points in the skin.

In treatment, the author tends to emphasize that in a first attempt to obtain relief from

pain, as little as possible of the face should be denervated. He is strongly opposed to denervation of the whole face when the pain is limited to the second and third divisions because, in his experience, it is by no means inevitable for pain starting in one division to spread in the future either to another division or to the whole face.

The author is a strong protagonist of fractional root section by the extradural route from the middle fossa for trigeminal neuralgic pains that do not affect the ophthalmic division.

He points out that if good results are to accrue from treatment, either by injection or root section, a correct diagnosis must be made; the pains must be characteristically spasmodic and short-lasting, with no accompanying objective sensory loss.

In this series of 250 cases there were no fatalities and no serious complications. 6 references. 4 tables.—*Author's abstract.*

188. *Intrathecal Injection and Cortical Application of Chloramphenicol—An Experimental Study with a Review of the Local Action of Antibiotics on the Central Nervous System.* JOHN W. HANBERY AND COSIMO AJMONE-MARSAN, Montreal, Canada. J. Neuropath. & Exper. Neurol. *13*:297–317, April 1954.

Pure crystaline chloramphenicol is relatively insoluble in water at room temperatures, extremely stable, and can be boiled for five hours or autoclaved for 30 minutes without loss of antibacterial action. One cubic centimeter of sterilized solution containing 1 mg. of chloramphenicol was injected daily into the cisterna magna of cats for eight days. Neither seizures nor signs of meningeal irritation were observed. Histologic studies showed only slight thickening of the leptomeninges over the base of the cerebral hemispheres, with no other evidence of inflammatory or degenerative changes in the central nervous system. Electrocortigrams obtained on cats under local anesthesia and curare showed no epileptiform activity up to nine hours following the local application of pure crystaline chloramphenicol to the motor cortex. A transient depression of spontaneous electrocortical activity was observed, as well as an increased response of evoked potentials recorded from sensory and auditory cortex. No significant cortical damage was observed following the application of crystaline chloramphenicol to the cortex of cats surviving for several hours, or in one animal allowed to survive for one month.

The experimental and clinical data pertaining to the local action of the other antibiotics were reviewed. We were able to confirm the findings of others regarding the convulsant effects of penicillin, streptomycin, and bacitracin, and also showed that pure neomycin sulfate and erythromycin possess epileptiform properties. Chlortetracycline, oxytetracycline, and polymyxin B had no convulsant effects but caused marked depression of electrocortical activity. Chlortetracycline and oxytetracycline caused severe cortical damage, while the cortex to which polymyxin B had been applied showed no significant change. 55 references. 10 figures.—*Author's abstract.*

For Reference Only

189. *Stellate Ganglion Block in Acute Cerebral Thromboses and Embolisms (Bloqueio do ganglio Estrelado nas Tromboses e Embolias Cerebrais Agudas).* JORGE ARMBRUST-FIGUEIREDO, Saõ Paulo. Arq. neuro-psiquiat. *12*:195, June 1954.

MISCELLANEOUS

190. *BAL in the Treatment of Neurological Syndromes.* HARRY M. SALZER, Cincinnati, Ohio. Dis. Nerv. System. *15*:67–71, March 1954.

BAL, or British anti-lewisite, which chemically is a dithiol (Dimercaptopropanol), was used in the treatment of 6 patients with Guillain-Barré syndrome, 2 patients with amyotrophic lateral sclerosis, 1 patient each with myasthenia gravis and multiple sclerosis, and 5 patients with encephalomyeloradiculitis.

A 10 per cent solution of BAL was used in a dosage ranging from 1.5 to 3 mg. per kilogram of body weight per day. This amount was usually 225 mg. (2.25 cc.) administered intragluteally daily for 10 days.

Side reactions, if they occur, usually consist of nausea, vomiting, and feeling faint. These symptoms can be minimized by the use of one of the aluminum hydroxide alkalis and chewing gum prior to administration. The injections are usually painful locally, but in no instance was there sterile abscess or any reaction requiring treatment.

In the 6 patients with Guillain-Barré syndrome, there was relatively prompt improvement. In the patients with myasthenia gravis, multiple sclerosis, and amyotrophic lateral sclerosis, there was no improvement.

In 4 of the 5 patients with encephalomyeloradiculitis there was improvement after the administration of BAL. 4 references.—*Author's abstract.*

191. *Ansotomy in Paralysis Agitans.* E. A. SPIEGEL, H. T. WYCIS, Philadelphia, Pa. Arch. Neurol. & Psychiat. *71*:598–614, May 1954.

A stereotaxic method for localizing and producing lesions of the ansa lenticularis (ansotomy) has been developed, using the foramen of Monro and the anterior commissure as reference points. Ansotomy is able to reduce, and, in some instances, almost completely to eliminate the parkinsonian tremor on the opposite side. These results could be obtained with preservation of volitional movements, without increase of muscle tone or disturbance of sensation. The ability to perform alternate movements, e.g. flexor-extensor movements of the fingers, may even be increased and rigidity sometimes diminished. The electropallidogram failed to show a relationship of its rhythm to that of the tremor or abnormalities indicative of gross pathologic changes. Based upon these experiences and upon animal experiments (combination of tegmental stimulation and mesencephalic lesions), a working hypothesis regarding the mechanism of the parkinsonian tremor is outlined. It is assumed that the static tremor is due to a release of the reflex arcs serving static innervation and synapsing in the rhombencephalic and mesencephalic reticulate substance from inhibitory influences that originate chiefly, but not exclusively, in the substantia nigra. The part of pallidofugal impulses conducted by the ansa lenticularis probably carries facilitating impulses to the tremor-genetic area in the tegmentum. The role of other pallidofugal fibers is being studied. 33 references. 10 figures.—*Author's abstract.*

BOOK REVIEWS

Connections of the Frontal Cortex of the Monkey. WENDELL J. S. KRIEG. Charles C Thomas, Springfield, Ill., 1954. Pp. 320. 186 illustrations. Price $10.50.

Until recently, it has been traditional to guide the student of neuroanatomy through a detailed, step-by-step study of the spinal cord with all of its tracts and nuclear groups, often with the aid of gaily colored diagrams and models, perhaps prepared by the student himself. Toward the end of the course, when he has proceeded in this manner as high as the basal ganglions and brain stem, he is briefly introduced to the few anatomic facts and many mysteries of the cortex. Although many isolated studies have contributed to our current knowledge of the cortex, the recent classic studies of Penfield, based upon stimulation and operation on the human brain, and of Von Bonin and Bailey *et al.*, by strychnine application to the brain of the chimpanzee, have contributed vastly to our knowledge, both of the anatomy and particularly the function of this region. Dr. Krieg's present book is the result of 10 years' preoccupation with the cortical connections of the monkey. It is based on the meticulous study of seventy lesions of the Macaque cortex made by thermocoagulation. The resulting tract degenerations were then studied in detail by the classic Marchi technic.

A distinctive feature of the work is the attempt to give the reader a three-dimensional view of the composite picture gained by detailed study of many sections. In doing this, the author has utilized the "phantoms" previously used in his textbook of neuroanatomy, as well as a new technique, a transparent reconstructed slice of the area involved. Although one can readily appreciate the time and skill that went into these preparations, this reviewer finds the amount of detail represented on some of the slices to be comparable to an attempt to absorb all that is going on in a three-ring circus at one time. It is, however, likely that interpretation would be easier for one more familiar with the landmarks of the cortex of the Macaque.

The greater part of the book represents the detailed study of four areas, namely, the motor area, the premotor cortex, the prefrontal, and the orbital areas. At the end of each study there is a synthesis of the connections represented. The final section deals with the significance of the study and its relationship to other types of study. The author has wisely refrained, however, from any lengthy philosophic discussion based on the findings. The findings that are most likely to become controversial, are pointed out by the author himself, such as the failure to demonstrate a direct connection between the cortex and the caudate, putamen, and pallidum.

This volume represents the essence of a long and intricate study, which has needed doing. It contains a vast amount of detailed information of reference type, and should be available to all serious workers in the fields of neuroanatomy and neurophysiology. It also contains sufficient stimulating material to be read with profit by neurologists, psychiatrists, neuropathologists and others concerned with cerebral organization. The collected papers on which the work is based are also available separately.—*Franklin Martin, Jr., M.D.*

Aphasia Therapeutics. MARY C. LONGERICH AND JEAN BORDEAUX. The MacMillan Co., New York, 1954. Pp. 185. Price $3.75.

The authors attempt to present the psychic and anatomic factors of aphasia "correlated with symptomatology, and with the various stages of treatment response." Chapters I and II deal with a review of the literature and symptomatology of aphasia. The classic studies of Goldstein, Mills, and Neilson are briefly presented. The chapter on symptomatology draws heavily on the works of these authors, particularly that of Neilson. The section on therapy consists mainly of a systematized drill book. No mention is made of improvisations or variations when these stereotyped approaches fail. The authors reiterate that their technics are evolved from personal research and experimentation, but in no part of the book do they quote any publication or report of any of their personal research. No original technics are suggested. Throughout the text, there is inappropriate deployment of psychoanalytic clichés that contribute nothing but obfuscation. For example, on page 159, "Most aphasics react to their traumatic condition by a regressing to more infantile levels of behavior." The neurologic basis of aphasia is treated in an elementary and often inaccurate manner, and dogmatic generalizations repeatedly exposed the naiveté of the authors: e.g., "Cortical injury nearly always produces apparently unconventional behavior"; "Brain trauma decreases or nullifies the normal memory span and ability to concentrate." On page 163, reference is made to "Occasionally an aphasic may indulge in uncontrollable spells of laughter. Such patients must be shown how to regain voluntary control of laughing. Only by making him aware of his own ability to do something about his difficulty can any help be given." Apparently, the authors are unaware that forced laughing is an organically determined and involuntary manifestation of a bifrontal lesion such as commonly occurs in pseudobulbar palsy.

In the bibliography, only four studies are listed with 1951 and 1952 publication dates. Of the four, one is concerned with hypnotism, one with cerebral palsy, one with neurosis, and one with speech disorders of military personnel. The literature from 1948 to 1954 is poorly covered and no reference is made to the significant research in stimulation studies of the brain, EEG investigations, and field theory applications.

The preface should have included more biographical and professional information about the authors.

The book is poorly documented, lacks original contributions, and oversimplifies the mechanism and therapy of aphasia.—*Harold Stevens, M.D.*